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MACWORLD

The Macintosh® Magazine

August 1990 $3.95 Canada $4.95

NEW

Personal LaserWriters from Apple



17 ACCELERATORS

55 UTILITIES

21 FILE SERVER PRODUCTS

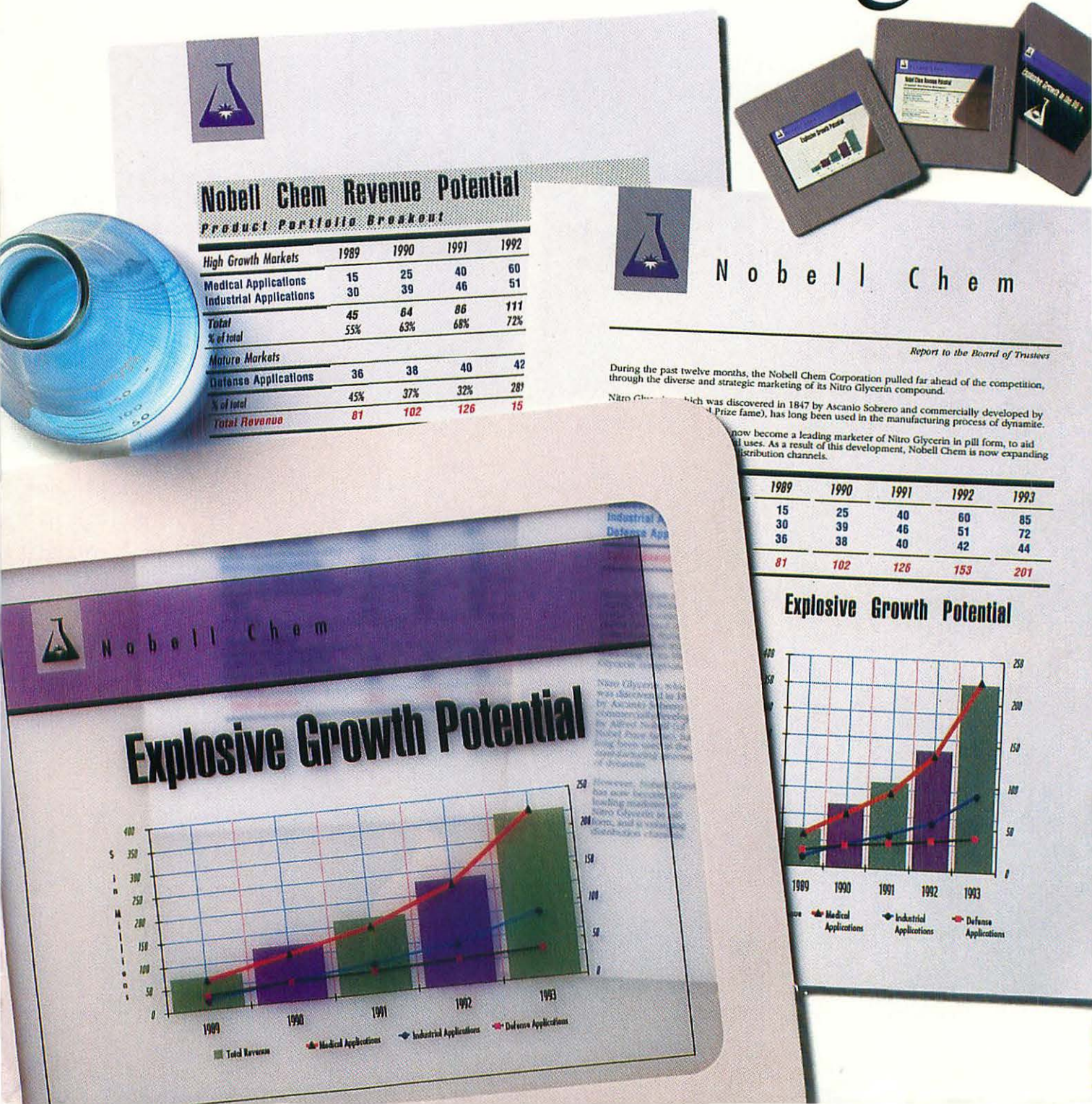
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Some think there's no a
Microsoft applications. T
the same thing abo



Nobell Chem Revenue Potential

Product Portfolio Breakout

High Growth Markets	1989	1990	1991	1992
Medical Applications	15	25	40	60
Industrial Applications	30	39	46	51
Total	45	64	86	111
% of total	55%	63%	68%	72%
Mature Markets				
Defense Applications	36	38	40	42
% of total	45%	37%	32%	28%
Total Revenue	81	102	126	153

Nobell Chem

Report to the Board of Trustees

During the past twelve months, the Nobell Chem Corporation pulled far ahead of the competition, through the diverse and strategic marketing of its Nitro Glycerin compound.

Nitro Gly... which was discovered in 1847 by Ascanio Sobrero and commercially developed by ...l Prize fame), has long been used in the manufacturing process of dynamite.

...now become a leading marketer of Nitro Glycerin in pill form, to aid ...l uses. As a result of this development, Nobell Chem is now expanding ...istribution channels.

	1989	1990	1991	1992	1993
	15	25	40	60	85
	30	39	46	51	72
	36	38	40	42	44
	81	102	126	153	201

Explosive Growth Potential

dvantage to combining hen again, some thought ut nitro and glycerin.

If you own a Mac® you may already know what a phenomenally powerful piece of software Microsoft® Word is.

And, most likely, you're also aware of how powerful Microsoft Excel is. Well here's something you probably don't know:

When Word and Microsoft Excel are combined, they're even *more* powerful. In fact, they're nothing short of explosive. Pun intended.

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We call this unprecedented feature "warm links." But you'll be more inclined to call it the best thing for revising documents since white out.

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This is where warm links saves the day (or the hour). No more antiquated manual moves of opening and closing your document, cutting, pasting and praying. With warm links, you simply open your Word document and select Update Link. Word automatically finds the latest Excel data and updates your report. It's as simple as it sounds.



After you update your data in Microsoft Excel, select "update link" from Word's edit menu, and the change will automatically appear elsewhere.

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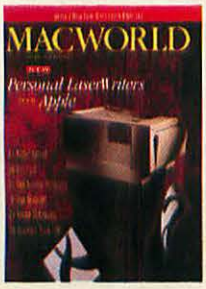
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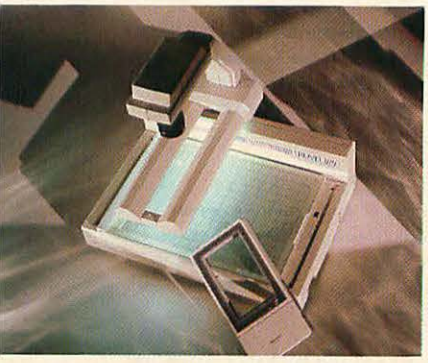
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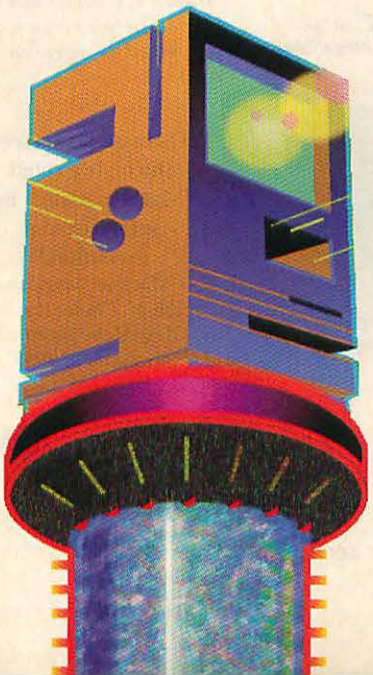
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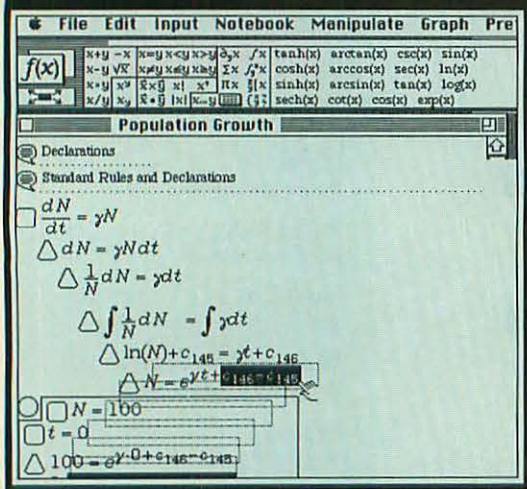
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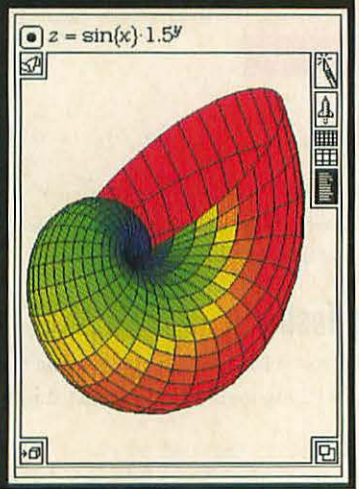
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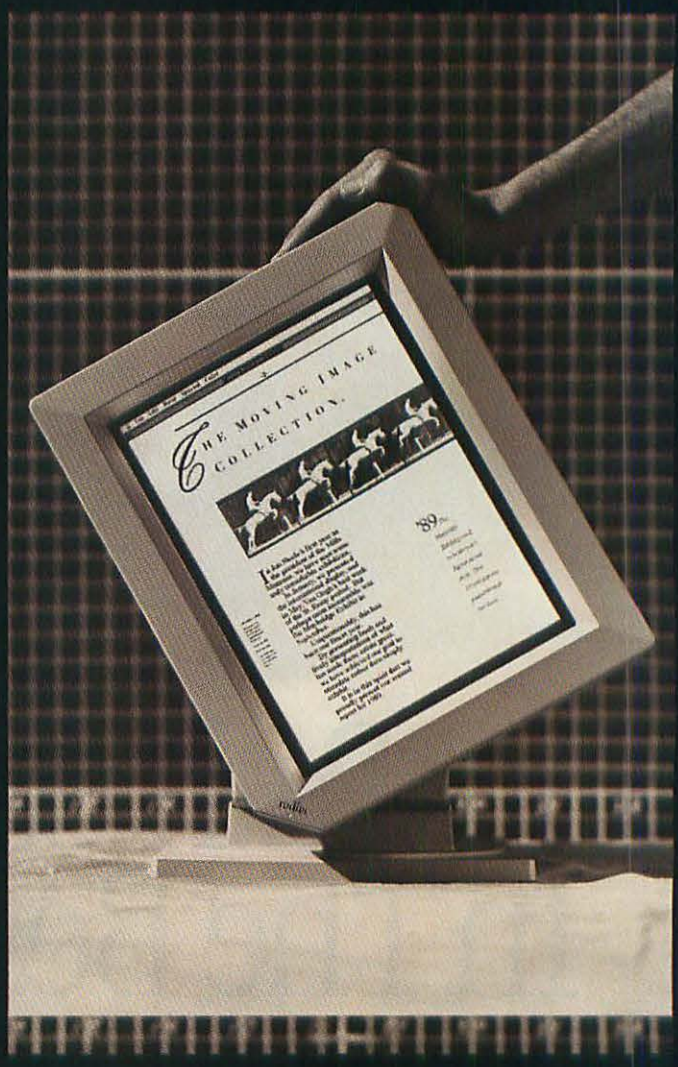
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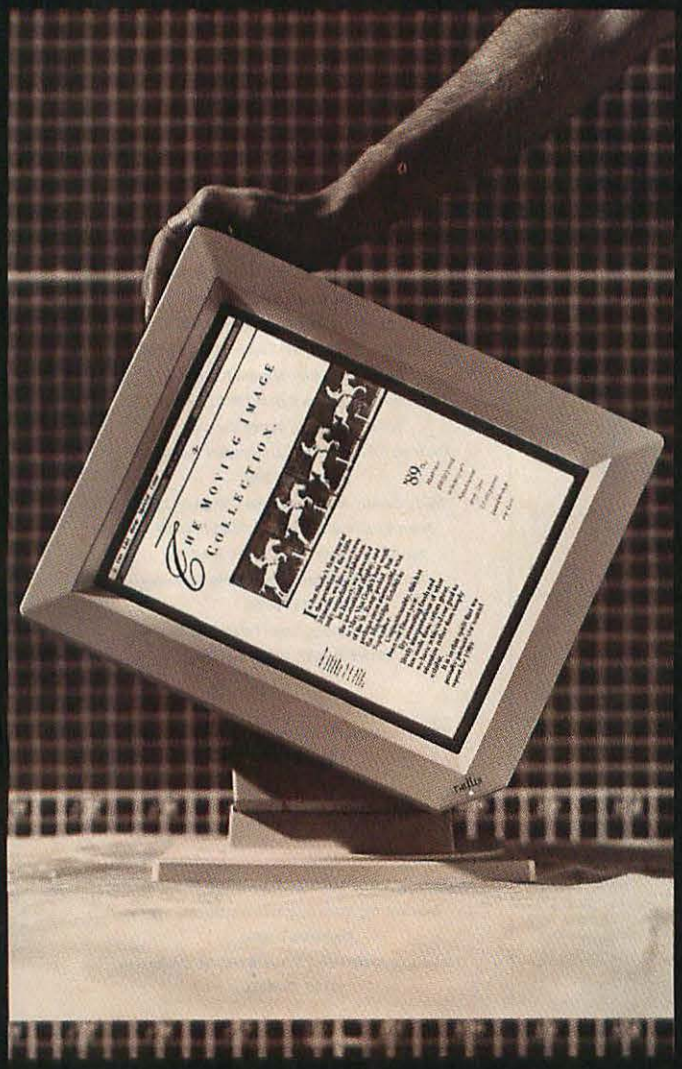


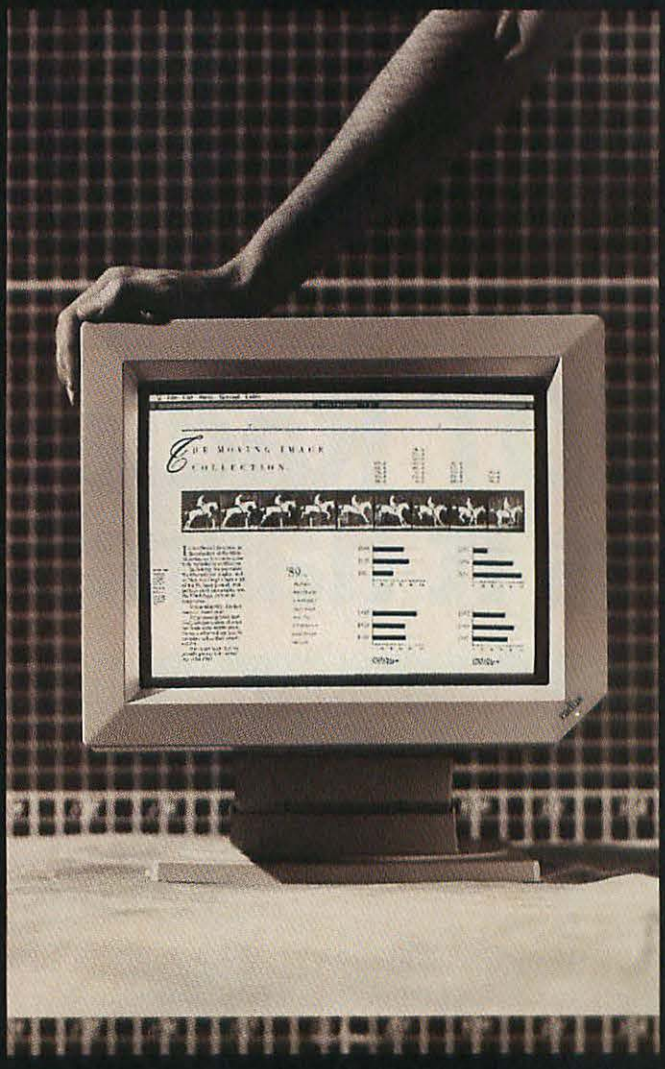


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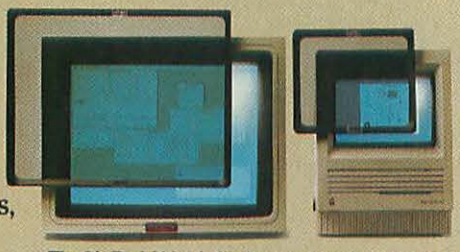
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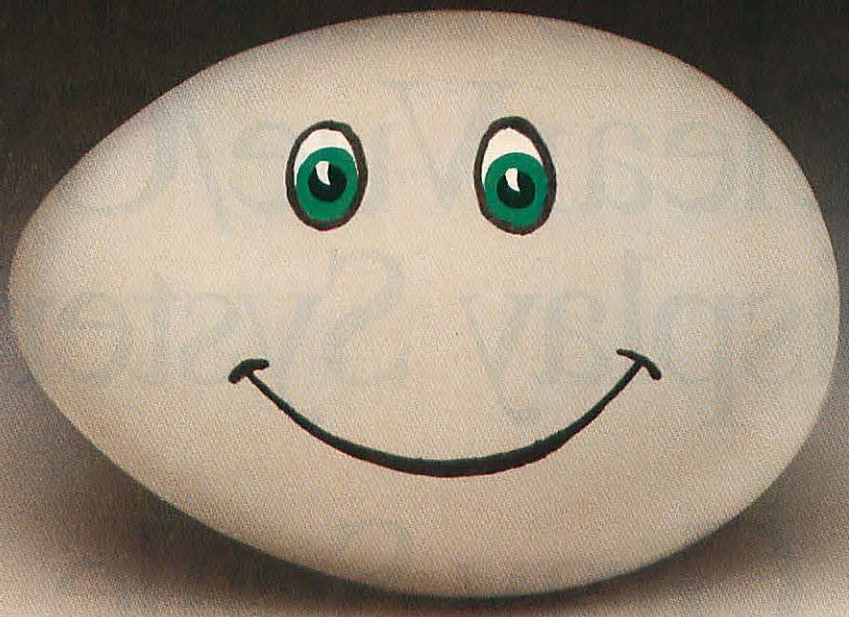
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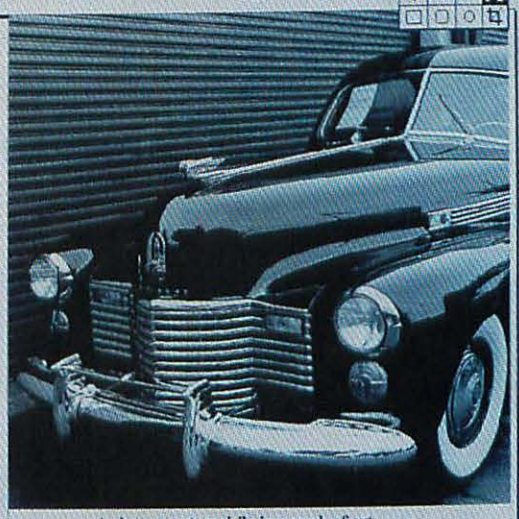
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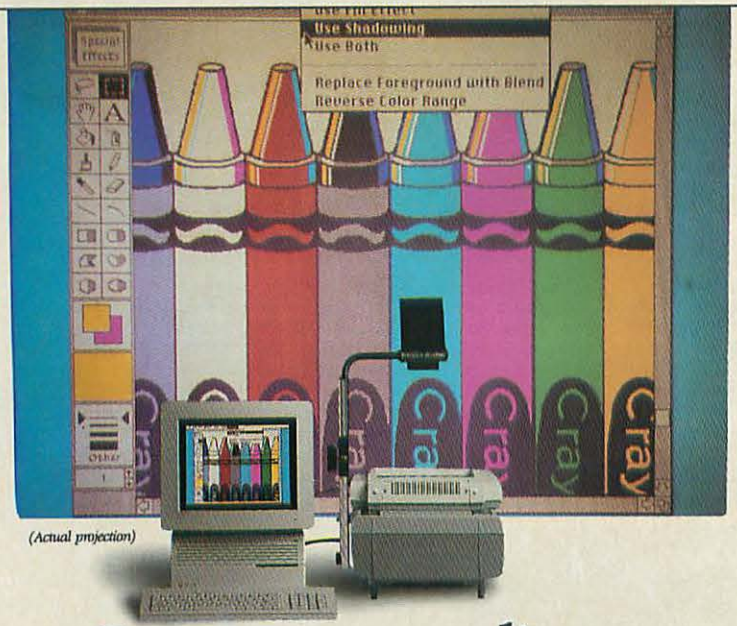
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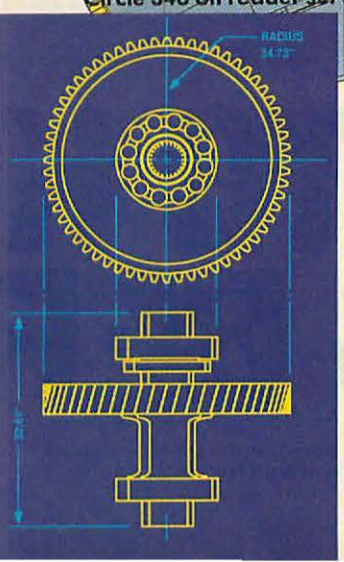
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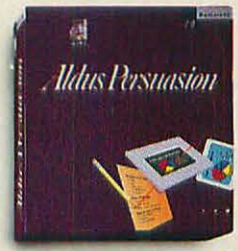
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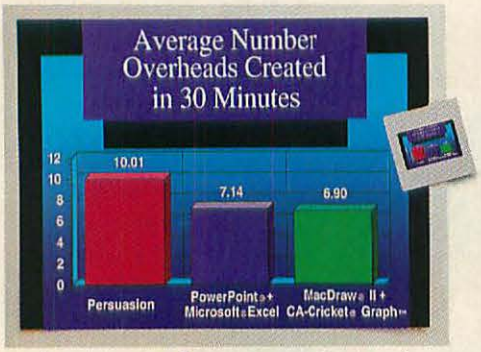
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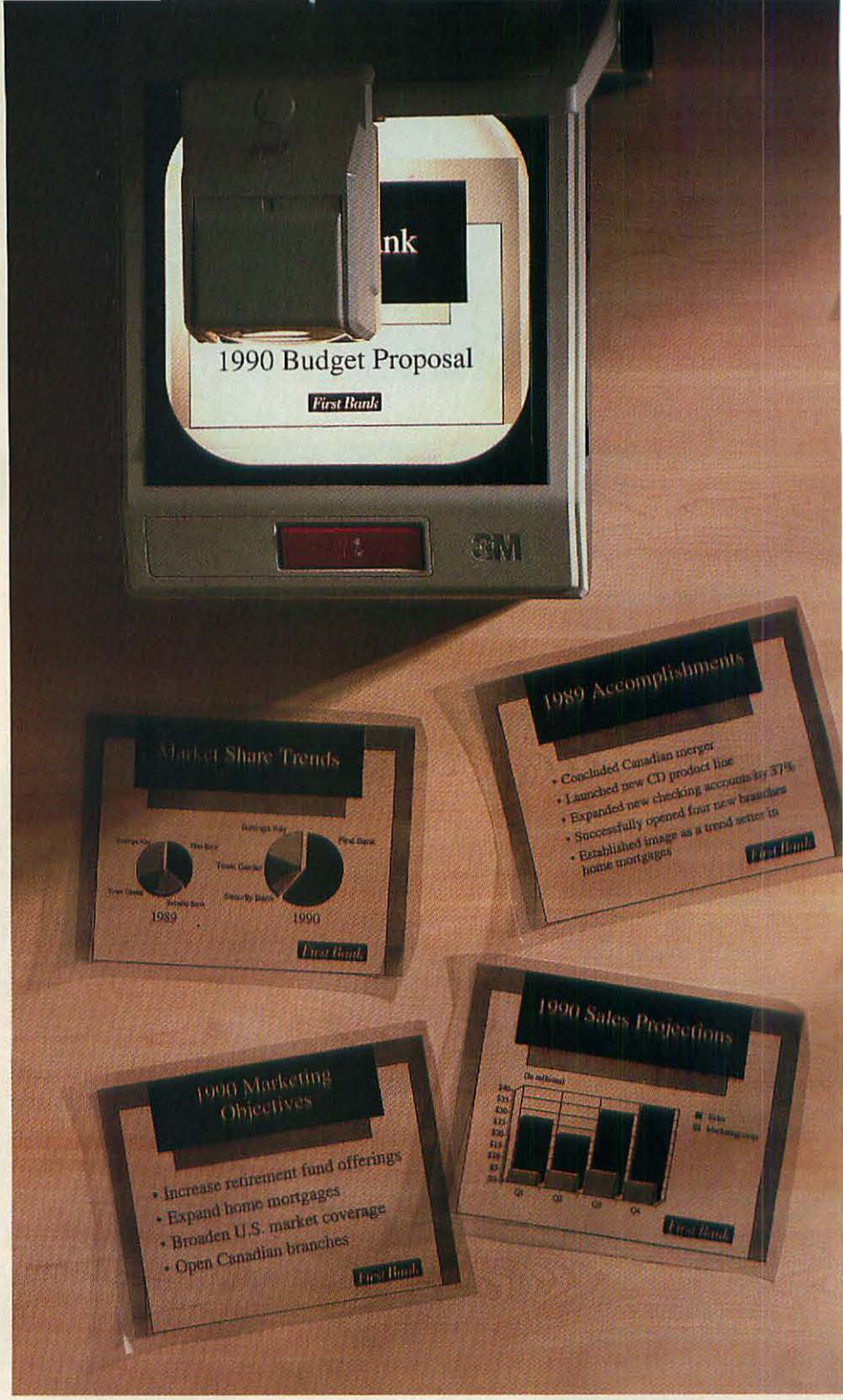
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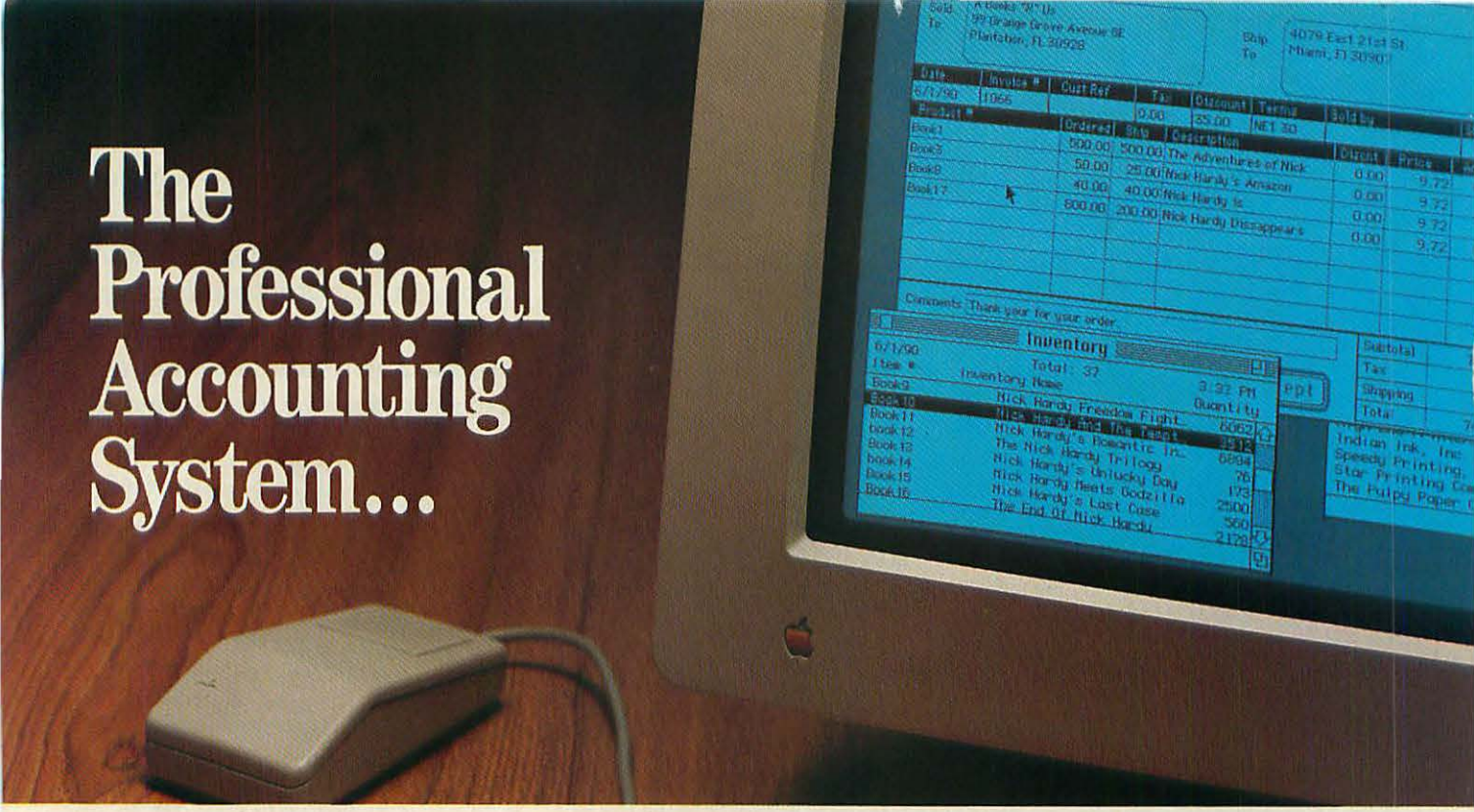
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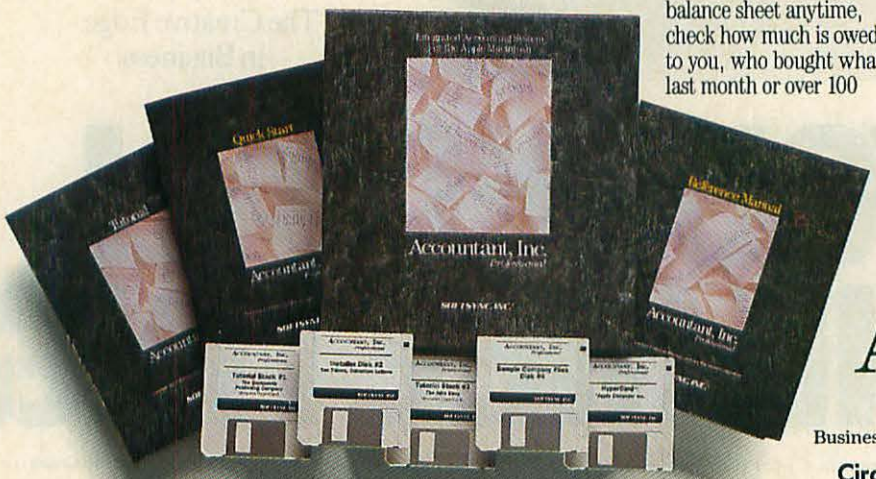
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MACBULLETIN

Apple Confirms Delay of System 7.0

At the recent 1990 Apple Worldwide Developers Conference in San Jose, California, Apple casually confirmed that System 7.0 will not ship this summer as previously announced. Apple now predicts that the troublesome operating system will be available by the end of the year. Apple sources say a significant part of the problem is that the proliferation of Mac hardware and software means longer and more complicated compatibility testing.

The Future of PostScript

Adobe is working on a new generation of PostScript, to be called PostScript Level 2. Level 2's enhancements include support for printing patterns and forms, the CIE color model, new screen and halftone algorithms, control of printer hardware (paper trays and staplers), improved speed and memory efficiency, improved compression for better color handling and fax output. Level 2 also incorporates earlier extensions for CMYK separations; Display PostScript; composite fonts (like kanji); and Microsoft Windows. Adobe says all current applications will print on Level 2–compatible printers when they become available in early 1991. Adobe CEO John Warnock says that over the next 10 to 15 years he envisions PostScript becoming a universal, device-independent data vehicle, with support for sound, video, and other formats.

Adobe, EFI Dispute Color Technology

A series of announcements charging that Adobe does not have the right to use color technology as implemented in PostScript Level 2 and Photoshop may darken the future of PostScript. Electronics For Imaging (EFI) claims that Adobe is infringing a patent held by MIT and licensed exclusively to EFI. Adobe's response is confusing: It argues that because the MIT patent covers hardware, the color capabilities of Adobe's software do not infringe EFI's license; at the same time, Adobe has filed suit seeking to have the MIT patent declared invalid.

The Unexamined Network

Status Mac is a utility that extracts information about each Mac on a network to help managers troubleshoot their networks. Status Mac gathers a wide variety of information about each CPU and its System files, applications, INITs, DAs, fonts, SCSI volumes, and ADB devices. Status Mac does not look at data files. It provides some data-analysis tools and can export information in SYLK format. A network manager might use the program to see if everyone has virus protection turned on, or to locate the person using an old version of the LaserWriter driver. Status Mac works across a network using Microsoft Mail 2.0, or it can be run at each workstation. Pricing was undecided at press time. For more information, contact Pharos Technology at 513/984-9273.

Apple Cuts Prices on the Portable

Apple recently cut the U.S. suggested retail price of the costly Macintosh Portable by $1000 to spur lagging sales. The Portable without a hard drive now lists for $4799. With an internal 40MB hard drive the Portable retails for $5499, also down by $1000. In addition, Apple dropped the price of the Portable's 1MB Memory Expansion Kit from $649 to $499.

A Virus Rival

Microseeds Publishing's new product, Rival, operates transparently in the background to protect against viruses. Instead of scanning floppies at insertion, Rival inspects files when they are opened or when Get Info is selected (Rival also catches viruses such as WDEF), notifying the user only when it discovers an infection. Rival lists for $99. As new viruses appear, Microseeds plans to distribute plug-in updates electronically; registered users can receive six updates by mail for $50. For more information, contact Microseeds at 813/882-8635.

Mac TV

Vent and Generation X Technologies have announced a video board that displays color Mac output on a television. The Vent 8-bit NTSC video board, listed at $599, hooks up to a cable-ready television set or VCR. The board is the first product to emerge from a joint technology agreement between video graphics manufacturer Generation X, and Nolan Bushnell's new multimedia company, Vent. For more information, contact Generation X Technologies at 408/739-4570.

Rock around the ROMs

Pioneer has announced that it is shipping the DRM-610 CD-ROM Changer, a CD ROM player that switches discs automatically. The DRM-610, which is listed at $1295, uses a six-disc magazine that can

(continues)

change CD ROMs in seven seconds or less. The player has an average access rate of 600 milliseconds. For more information, contact Pioneer at 201/327-6400 or 800/527-3766.

Mac Hammer

FWB has announced that it is adding three new products to its line of storage devices: an internal hard drive, an erasable optical drive, and an expandable chassis for storage devices. The hammer155FMFi internal hard drive, listed at $4095, has a 7-millisecond average access time and is compatible with the Mac II, IIx, and IIfx. The hammerDisk1000 erasable optical drive, listed at $8995, uses 500MB Sony and Ricoh removable cartridges and has an average access time of 35ms. The Sledgehammer FMF expandable chassis can incorporate many types of storage devices with a total of up to 2 gigabytes of storage space. The subsystem can configure its storage devices in a variety of ways to speed up storage and protect data. The 600MB base configuration of the Sledgehammer FMF lists at $8795. For more information, contact FWB at 415/775-2125.

Text Indexer Announced

The company that publishes the relational text-searching utility Sonar Professional is preparing a $79.95 indexing tool called Bookends. Bookends generates indexes based either on the frequency with which a word appears or on a user-supplied word list. It can create a multilevel index from a multilevel word list, ignore user-specified words, and support difficult formats such as text from mainframe computers. Sonar Professional has been upgraded to version 6 with support for zoom boxes, status indicators, and user-definable display fonts. It can paste Clipboard contents to a closed file, it can search with wild cards and Boolean algebra, and it has better network support. Both Sonar Professional and Bookends are available in case-sensitive and non-case-sensitive versions. For more information, contact Virginia Systems Software at 804/739-3200.

Flex Your Graphs

Version 1.1 of FlexiGraphs, a charting program that lets you draw charts and then extract the numbers behind them, adds polynomial curve fitting. This feature translates the slope and *y*-intercept of line charts into various mathematical equations including average, linear, quadratic, cubed, fourth power, and fifth power. FlexiGraphs 1.1 also adds a smoothing function for jagged-line charts and can import scanned or drawn images from the Clipboard and trace them to extract the numbers that created them. FlexiGraphs 1.1 lists for $149. For more information, contact Tree Star at 805/682-4096.

Double Time

Version 2.0 of Salient's file-compression utility, DiskDoubler, lets you decompress and open files by showing compressed files in the creating application's Open File dialog; double-clicking a compressed file in the Finder launches the creating application as it decompresses the file. DiskDoubler 2.0 can also decompress StuffIt and PackIt archives. Salient claims DiskDoubler 2.0 compresses and expands files more than twice as fast as StuffIt 1.5.1. Version 2.0 of DiskDoubler lists for $79 and upgrades are free for owners of 1.0 or 1.1. For more information, contact Salient at 415/852-9567.

Just Read It

Olduvai is developing ReadForm, a forms-recognition add-on for its soon-to-be-released Read-It O.C.R. Professional 3.0. ReadForm will recognize the contents of fields in scanned forms and save the data in formatted text files for import into databases. Olduvai says Read-It 3.0 Professional will recognize all fonts, discriminate between text and graphics, read multiple-page documents, and recognize all European characters including Cyrillic. ReadForm will list for $295; Read-It O.C.R. Professional 3.0 for $249; upgrades from 2.0 and 2.1 will be available for less than $100. For more information, contact Olduvai at 305/665-4665.

Apple Goes ISDN

At its Worldwide Developers Conference, Apple announced its first phase of support for Integrated Services Digital Network (ISDN) with the ISDN Developers Toolkit. ISDN is an evolving set of standards that allows one high-speed, circuit-switched digital network to carry voice, data, text, and image simultaneously. The ISDN Developers Toolkit consists of an Apple ISDN NB NuBus board and Integrated Voice/Data Manager software, a group of Macintosh Communications Toolbox tools. The ISDN Developers Toolkit, available only to selected Mac developers, provides the basic software and hardware necessary to access an ISDN network and its services. Farallon also showed a demonstration-only version of its Timbuktu/Remote screen-sharing software that supports Apple's ISDN NB board. For further information, contact Apple Developer Services at 408/974-4897.

Advice for Writers

We live in modern times, but some rules are still written in stone, including the grammar and style rules that Petroglyph has incorporated into Editorial Adviser, one of the first commercial HyperCard 2.0 stacks. Editorial Adviser is not a grammar-checker or a spelling-checker; it is an online style manual covering everything from grammar, punctuation, and spelling to indexing and citations. A section on copyediting shows how to use copy-edit marks. Editorial Adviser has a stack for recording in-house style decisions, which it displays in the main stacks. Editorial Adviser will list for $149.95. For more information, contact Petroglyph at 415/979-0588. M

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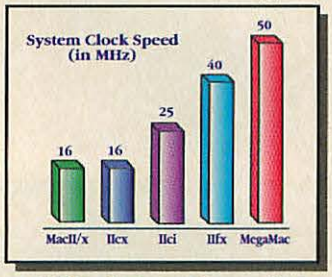
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CPU Performance Comparison

As User-Friendly as the Mac Itself.

If you're thinking the MegaMac is just another accelerator board, think again. The MegaMac is a totally self-contained *CPU Performance Extender* — with its own memory, microprocessor *and* power supply. There's even an internal, 'fx' style Processor Direct/NuBus expansion slot and an extra 5¼" drive compartment for installation of a high performance disk or tape back-up device. Plus, unlike some accelerator boards that require tedious and tricky Macintosh circuit board modifications, the MegaMac connects to your Mac via a snap-in NuBus accessory card. There's no soldering, no tearing your system apart and no complicated software to install. Just plug it in, power-up and hold on to your socks!

The secret to MegaMac's astonishing performance is its proprietary design. A 68030 50MHz processor coupled with 64K of 12 nanosecond write-through™ caching and on-board, high speed dynamic RAM (up to 64 megabytes) provides blistering fast program execution. The bottom line? In a word, p-r-o-d-u-c-t-i-v-i-t-y. . .gains greater than you ever imagined.

The NewCo Three -Year Protection Plan.

Of course, no matter how innovative a new product might be, it's no better than the company that backs it. That's why every MegaMac comes with an incredible three-year factory warranty and a 31-day 'try it/buy it' satisfaction guarantee. We can afford to stand behind our products so well because we've been making microcomputer products even longer than Apple — nearly 18 years now!

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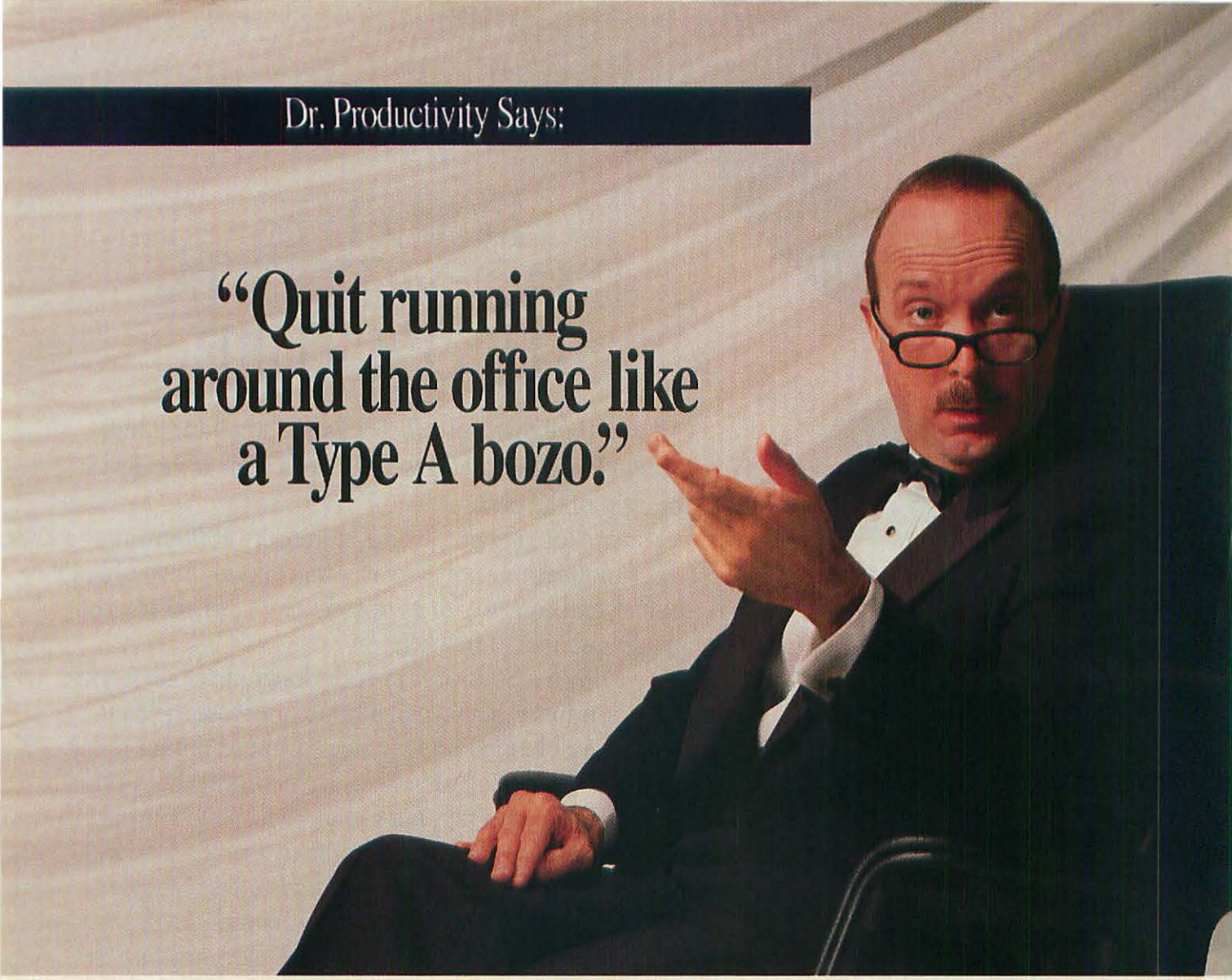
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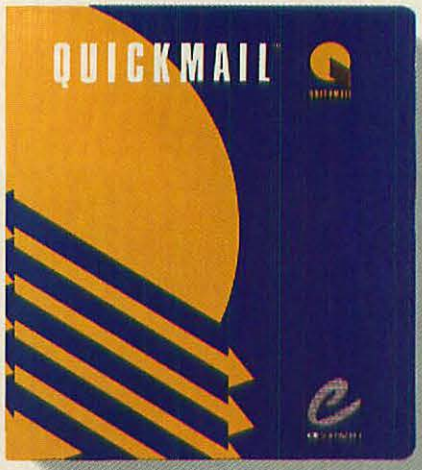
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Reviewing the Expo

My take on the biggest Mac show

BY JERRY BORRELL

We all groaned at first—no January show in San Francisco, we had to wait for April. In the end, the wait seemed worth it. Exhibitors had a more relaxed Christmas holiday season and some more time to work on new products. Attendees lined up as never before—to the tune of 60,000—according to the organizers. Despite the many products to be seen, the lament of "there's nothing new" from the general press became a litany.



Show News

Word Processors Let's start with word processors. WordPerfect was showing its latest version, indicating a desire to come from behind (it's fourth in the Mac word processor market after Microsoft Word, WriteNow for Macintosh 2.2, and MacWrite II). FullWrite Professional is still progressing, but no one seems to notice except for a dedicated crowd of enthusiasts. Nisus, initially an unknown face in the crowd, has built a nice single-digit market share for itself in a relatively short time, passing FullWrite. Nisus 2.1 is shipping, with 3.0 due out in June.

Spreadsheets There's nothing much to report here, except that Excel is nearing 1 million installed copies. Full Impact has lost impetus in the market with the general (and undeserved) miasma surrounding Ashton-Tate. Bill Lyons, originally brought in from IBM to head up the Mac division, is now in control of the company and is on the record with strong support for the company's Mac products. But that didn't stop rumors about a possible sell-off of the company's Mac products so that it could concentrate on its ailing PC product line. Informix's Wingz has continued to improve, reaching nearly 10 percent market share over the last year (nonannouncement of the show—Wingz for the Next machine).

Databases Well, most people still don't buy a Mac for its database programs, but the market continues to be strong for several players. Omnis has made a comeback with version 5. Odesta seemed to have lost interest in Double Helix due to its other projects (ODMS, GeoQuery) but now shows signs of returning its attention to its best-selling product. Claris announced FileMaker Pro, and is doing land-office business with that product. I was chastised by people at Claris for citing a 2500-per-month run rate for FileMaker II. It's closer to 5000 to 6000 per month, came the angry retort from Claris, making the product one of two big money-makers for the company. FoxBase+/Mac continues to sell well, but is behind FileMaker in sales. ACIUS announced a major change for its products by developing a database with related word processing, drawing, spreadsheet graphing, and other components. Marylène Delbourg-Delphis and Laurent Ribardière (developer of 4D) are on the scene in the States a great deal now, and things are cracking at 4D central. Version 2.0 of 4th Dimension pushed sales ahead of other Mac databases this year. Missing in action: Reflex Plus, dBase Mac. Unannounced at showtime: Symantec's Q&A.

Graphics As a category, graphics includes painting, drawing, illustrating, and image processing. As a group these applications have surpassed database sales for the second year on the Mac. Missing in action: major updates of Aldus FreeHand and Adobe Illustrator—due for demonstration at the August Expo in Boston. Clearly FreeHand 2.0 has outsold Illustrator this year. Both companies are at work on major changes that they hope will blow the competition away.

Canvas and MacDraw II are locked in battle, with the faster developers at Deneba continuing to eat market share at the expense of Claris. MacDraw II is still the larger seller (as much as twice the number of units in some months), but the two companies are now locked into an Illustrator/FreeHand–scale competition. Deneba's lower overhead makes Canvas a powerful profit-maker for the company. Deneba showed a new version of Canvas and both com-

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panies are working on major releases for the August Macworld Expo.

Color Paint Among color paint programs, PixelPaint Professional (which makes up for the faulty last version of PixelPaint) continues to dominate. But peregrine Electronic Arts has reentered the market with Studio/32. Olduvai has reannounced an old favorite, GraphistPaint, as VideoPaint. There's a new version of Computer Friends' little-promoted but capable paint program, Modern Artist. Finally, Deneba's UltraPaint looks like the stiffest competition for PixelPaint Professional, reaching over 10,000 units of sales in its first three months (sure sign of a hit).

The fun announcements of the show came from Delta Tao software with its $99 Color MacCheese 32-bit paint program, and from Creative Software with its Easy Color Paint for $79. SuperPaint, although it's color, really doesn't compete with these players. Computer Associates seems to have abandoned Cricket Paint.

Black-and-White Paint CE Software, ever the opportunist, announced Amazing Paint, a $99.95 black-and-white paint program aimed at the 1 million–plus users of monochrome Macs. The company must have noted the departure of Zedcor (DeskPaint is now in color as part of Desk and costs more), Claris (which unofficially is letting MacPaint die), and Silicon Beach (which is migrating away from the low-cost black-and-white market).

Image Processing Basically I'm talking about Letraset's ColorStudio and Adobe's new Photoshop. Arguably ColorStudio belongs in the paint category, but it's my call that these two programs are primary competitors. Adobe's booth was swamped with people, keeping it busier than at any time since the company announced Illustrator three years ago. Photoshop is a major hit for the company and a welcome addition to the Macintosh software family. It (and the departure of Jean-Louis Gassée from Apple) appears to be a major factor in improving relations between Apple and Adobe. Photoshop has a capable paint program, powerful image-processing features (particularly for image composition), and an invaluable ability to open and save graphics documents in any format you might want without having to resort to the original application (I would buy the program for this feature alone).

Desktop Publishing This field, making a transition from DTP to plain old publishing, is in the midst of a quiet revolution. Pity Apple seems so focused on multimedia. Aldus and Quark are really expanding the Mac in publishing. Aldus PageMaker continues its inexorable growth in market domination and in features, while QuarkXPress continues to grow in market share (almost exclusively at the expense of ReadySetGo) and to grow in its association with high-end, professional color publishing applications. Version 3.2 of QuarkXPress and 1.0 of DesignStudio both feature the pasteboard metaphor of PageMaker.

Type Microsoft, Apple, Adobe, and others seem to have settled down to the task of making good on their promises that everyone's printers and software will handle the competitors' products. The real interest for me at the show was the evolution of the Adobe Type 1 font-design tools from Altsys and Letraset. James Von Ehr's combination of Fontographer 3.1 for Type 1 font design and Metamorphosis for conversion of bitmaps and Type 3 fonts is a real winner. Similarly, the editing tools for FontStudio (the old Fred Font) are remarkable. The products compete—and do overlap in many ways—but the professional type designer will probably need all three. Taken together they represent a renaissance of type-design products for the Mac—and they make me want to design a typeface.

Integrated Software It's inevitable that Microsoft will continue to dominate this category of Mac software. With about 1.1 million copies of Works sold worldwide, the product is a real cash cow for the company, and the integrated product of choice. However, as in the spreadsheet category, Microsoft continues to garner potential competition. In the competition for the user who wants one simple product that will do everything, early entries include TML, from the terrible twins of programming language fame, Tom and Bob Leonard; and RagTime 3, from the technical trio

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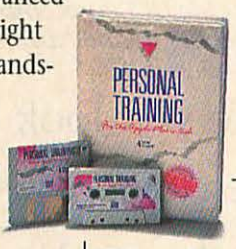
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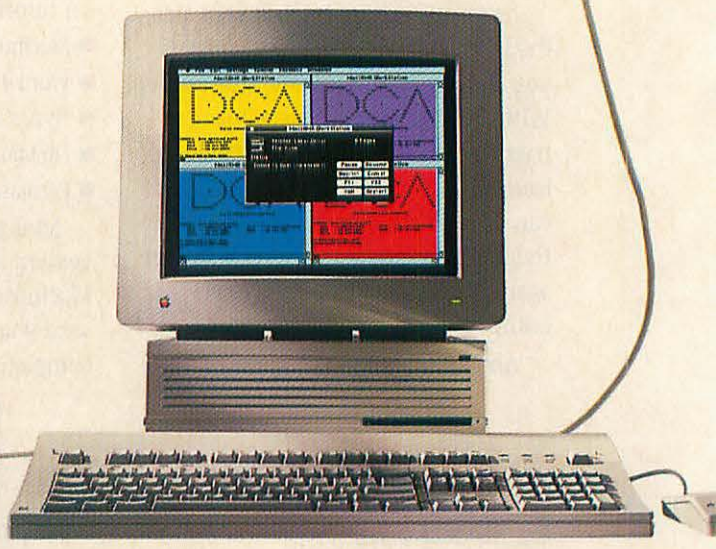


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Calls	01/29/85	100	$4.38	$230.00	$43,980.00	02/11/85	$5.63	$267.50	$55,982.50	$12,002.50
Puts	03/12/85	100	$2.88	$209.25	$28,959.25	03/19/85	$4.00	$218.75	$39,781.25	$10,822.00
Calls	04/26/85	100	$3.50	$209.25	$35,209.25	05/20/85	$6.75	$301.25	$67,198.75	$31,989.50
Calls	06/26/85	100	$2.38	$209.25	$23,959.25	07/01/85	$3.13	$209.25	$31,040.75	$7,081.50
Calls	07/18/85	100	$5.00	$248.75	$50,248.75	07/23/85	$3.75	$211.25	$37,288.75	($12,960.00)
Puts	08/13/85	100	$3.25	$209.25	$32,709.25	08/26/85	$2.75	$209.25	$27,290.75	($5,418.50)
Puts	09/16/85	100	$2.25	$209.25	$22,709.25	09/26/85	$2.50	$208.75	$24,790.75	$2,081.50
Calls	11/05/85	100	$4.88	$245.00	$48,995.00	12/18/85	$19.63	$1,962.50	$195,562.50	$146,567.50
Calls	01/27/86	100	$3.25	$209.25	$32,709.25	03/04/86	$10.00	$1,000.00	$100,325.00	$75,615.75
Calls	03/12/86	100	$4.75	$241.25	$47,741.25	04/29/86	$9.63	$962.50	$95,862.50	$40,121.25
Calls	05/21/86	100	$4.50	$233.75	$45,233.75	06/09/86	$5.63	$531.25	$97,108.75	$51,875.00
Calls	08/06/86	100	$4.13	$222.50	$41,472.50	09/05/86	$8.13	$481.25	$127,018.75	$85,546.25
Calls	09/17/86	100	$4.50	$233.75	$45,233.75	11/13/86	$6.88	$305.00	$68,445.00	$23,211.25
Calls	11/25/86	100	$4.13	$222.50	$41,472.50	12/17/86	$6.00	$245.00	$40,505.00	$7,032.50
Puts	01/02/87	100	$2.38	$209.25	$25,959.25	01/16/87	$3.00	$209.25	$29,790.75	($14,168.50)
Calls	01/08/87	100	$6.75	$301.25	$67,801.25	03/03/87	$29.63	$2,962.50	$295,262.50	$227,461.25
Calls	03/05/87	100	$3.50	$209.25	$35,209.25	03/12/87	$2.94	$294.00	$29,165.75	($6,043.50)
Calls	03/20/87	100	$4.75	$241.25	$47,741.25	04/07/87	$8.25	$825.00	$82,153.75	$34,412.50
Calls	05/06/87	100	$3.75	$211.25	$37,711.25	05/08/87	$3.63	$362.50	$22,290.75	($15,420.50)
Puts	05/19/87	100	$4.88	$245.00	$48,995.00	05/21/87	$8.38	$838.00	$34,676.25	$25,681.25
Calls	06/17/87	100	$4.25	$226.25	$42,726.25	07/16/87	$7.00	$700.00	$82,153.75	$39,427.50
Calls	07/31/87	100	$3.13	$209.25	$31,459.25	08/03/87	$2.00	$200.00	$49,751.25	$18,292.00
Calls	08/10/87	100	$5.88	$295.00	$59,295.00	08/12/87	$13.69	$1,368.75	$136,390.55	$77,365.55
Puts	09/09/87	100	$4.38	$230.00	$43,980.00	09/10/87	$3.63	$362.50	$36,040.75	($7,939.25)
Puts	10/08/87	100	$2.75	$209.25	$27,709.25	10/07/87	$97.00	$9,700.00	$967,242.50	$889,439.37
Puts	11/10/87	100	$3.00	$248.75	$50,248.75	11/11/87	$5.63	$562.50	$56,605.63	$6,356.88
Calls	11/13/87	100	$2.13	$203.75	$25,203.75	11/24/87	$2.00	$200.00	$23,540.75	($11,663.00)
Calls	12/15/87	100	$3.13	$209.25	$31,459.25	12/24/87	$8.50	$850.00	$84,646.25	$53,187.00
Calls	02/11/88	100	$3.75	$209.25	$37,709.25	03/14/88	$5.63	$562.50	$75,922.50	$37,213.25
Puts	03/25/88	100	$4.38	$209.25	$43,959.25	04/15/88	$5.63	$562.50	$55,982.50	$22,023.25
Calls	05/16/88	100	$4.63	$231.25	$46,487.50	05/16/88	$5.25	$256.25	$52,243.75	$5,756.25
Calls	05/26/88	100	$4.25	$226.25	$42,726.25	05/27/88	$15.00	$1,500.00	$149,451.25	$106,725.00
Calls	08/01/88	100	$4.00	$220.00	$40,220.00	08/05/88	$2.63	$262.50	$26,040.75	($14,179.00)
Puts	08/10/88	100	$4.00	$218.75	$40,218.75	08/24/88	$7.38	$737.50	$73,430.00	$33,211.25
Puts	10/05/88	100	$3.25	$209.25	$32,709.25	10/10/88	$3.00	$300.00	$19,790.75	($12,918.50)
Calls	10/18/88	100	$5.50	$263.75	$55,263.75	10/20/88	$3.50	$350.00	$94,616.25	$39,352.50
Calls	01/09/89	100	$7.13	$312.50	$77,562.50	02/07/89	$16.00	$1,600.00	$179,361.25	$101,798.75
Calls	02/17/89	100	$6.25	$286.25	$62,786.25	02/21/89	$2.25	$225.00	$52,243.75	($10,542.50)
Puts	02/23/89	100	$3.75	$211.25	$37,711.25	02/28/89	$1.88	$187.50	$48,505.00	$10,793.75
Calls	03/06/89	100	$5.63	$267.50	$56,517.50	03/17/89	$9.38	$937.50	$83,400.00	$26,882.50
Calls	03/29/89	100	$6.38	$290.00	$64,040.00	04/02/89	$10.75	$1,075.00	$167,078.75	$103,038.75
Puts	05/10/89	100	$2.63	$209.25	$26,459.25	05/12/89	$1.75	$175.00	$17,290.75	($9,168.50)
Calls	07/06/89	100	$5.75	$271.25	$57,521.25	08/14/89	$25.00	$2,500.00	$249,326.75	$191,555.50
Calls	08/24/89	100	$3.63	$209.25	$36,459.25	08/25/89	$8.13	$812.50	$80,907.50	$44,448.25
Calls	09/28/89	100	$4.13	$222.50	$41,472.50	10/09/89	$11.25	$1,125.00	$112,063.75	$70,591.25
Calls	12/29/89	100	$4.13	$222.50	$41,472.50	01/03/90	$8.25	$825.00	$82,153.75	$40,681.25
Puts	01/09/90	100	$5.50	$263.75	$55,263.75	01/15/90	$13.00	$1,300.00	$129,511.25	$74,247.50
Puts	01/16/90	100	$8.75	$361.25	$87,861.25	01/24/90	$14.88	$1,487.50	$148,205.00	$60,343.75
Puts	02/21/90	100	$4.25	$226.25	$42,726.25	02/26/90	$2.94	$294.00	$29,188.13	($13,538.13)
Calls	03/16/90	100	$6.63	$297.50	$66,547.50	03/20/90	$10.00	$1,000.00	$99,601.25	$33,053.75
Calls	04/12/90	100	$5.50	$263.75	$55,263.75	04/16/90	$8.25	$825.00	$82,153.75	$26,890.00
Puts	04/19/90	100	$5.00	$248.75	$50,248.75	04/27/90	$10.00	$1,000.00	$99,601.25	$49,352.50
Calls	05/08/90	100	$4.75	$241.25	$47,741.25	05/14/90	$19.25	$1,925.00	$191,823.75	$144,082.50
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of West German developers who brought you RagTime 1 and RagTime 2. RagTime 3 seems to be successful in its latest reincarnation as an integrated product. And finally, another integrated package, Unity, was also showing at the April Macworld Expo.

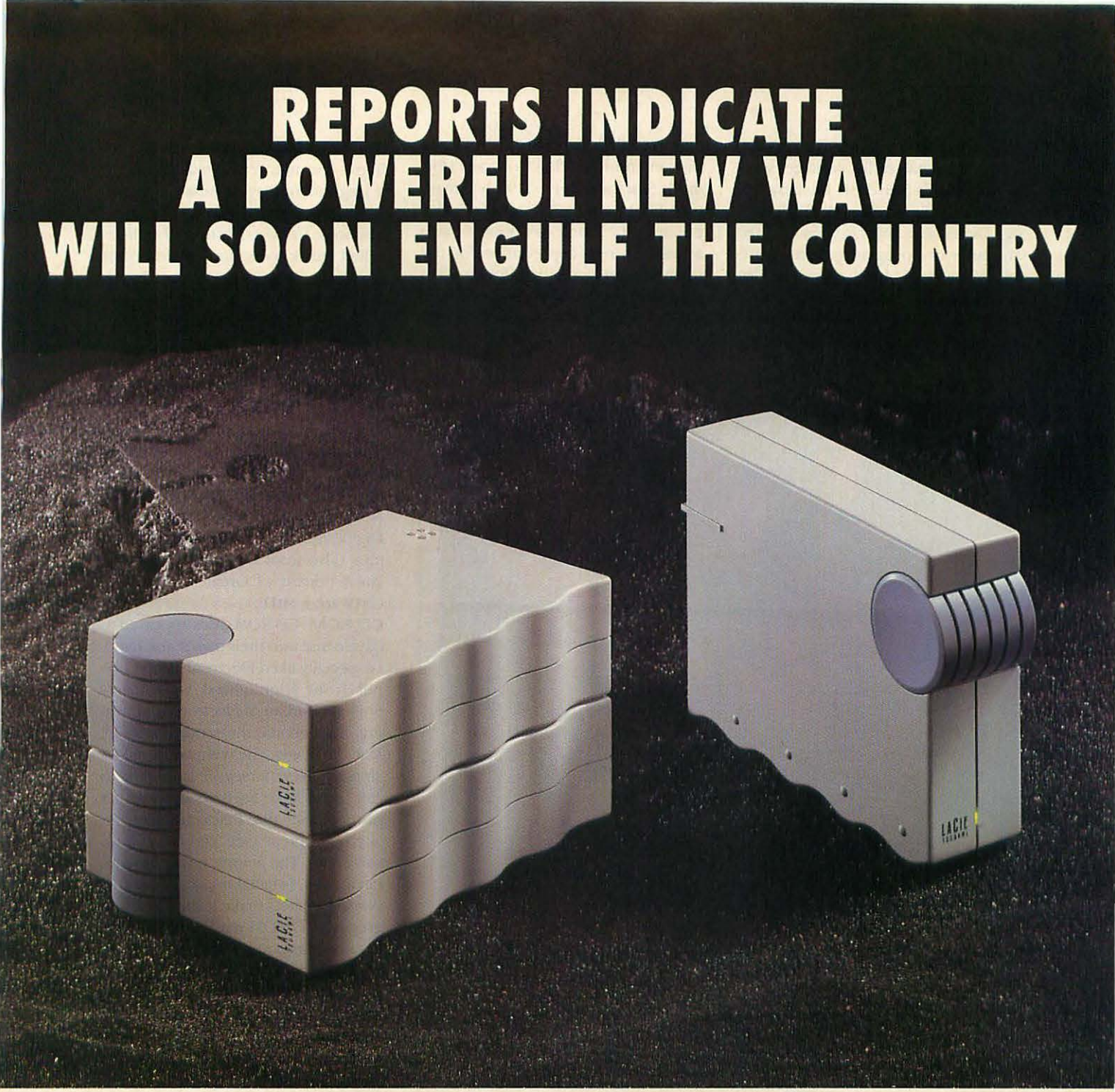
I predict Works will lose bigger market share in its category than Excel has in spreadsheets—users will appreciate the innovation and features of RagTime (strong in graphics) and TML (strong in word processing and spreadsheets).

Computer-Aided Design The strongest aspect of Mac CAD sales continues to be 2-D, and Claris CAD leads the market amid general slow growth. But IDD, developer of MacDraft and Dreams, has returned to its roots (and complaining users) with a major upgrade for the largest-installed-base CAD product on the Mac, MacDraft, with version 2.0. With over 75,000 units installed, IDD could recover and focus its Dreams product on 3-D users. Graphsoft, the Maryland-based developer of MiniCad+ (arguably the best product for drafting on the Mac), has issued version 3.0 of that product. The Hungarian hungries at Gimeor are readying version 5.5 for summer and a new low-cost product (also for summer?). At present Gimeor has perhaps the favored high-end CAD product for architectural design and Gimeor dominates the European market. DynaPerspective, the Japanese product from Dynaware, is now in version 2.0, which is faster (if not easier to use) than its earlier incarnation. Meanwhile, the parent company in Japan has over 17 Mac products in the works, the first of which, MacBallade (that's right, music), was at the show. Schlumberger showed version 2.0 of MacBravo. And another Hungarian developer, Graphisoft, (as distinct from Graphsoft) announced version 3.42 of ArchiCAD, which is also slanted strongly toward architectural design.

Two products in various stages of development for the Mac are a real winner called Shade from a company called SystemSoft (located in Los Altos, California) and a prototype from Duane Maxwell (of Levco fame). Both of these products need to be seen to be appreciated. They are second-gen-

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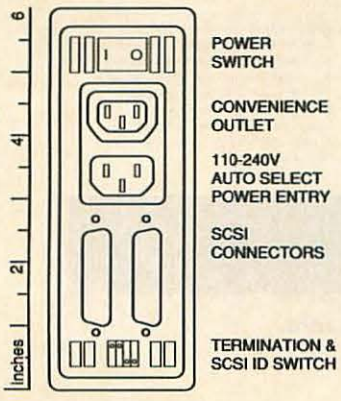
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Circle 197 on reader service card

eration 3-D products, with more powerful editors than earlier packages such as Paracomp's Swivel 3D Professional (now in version 2.0) and VIDI's Design Dimensions (now in version 2.19). The latter two programs are the leading sellers in 3-D for the Mac and deserve a new look as well.

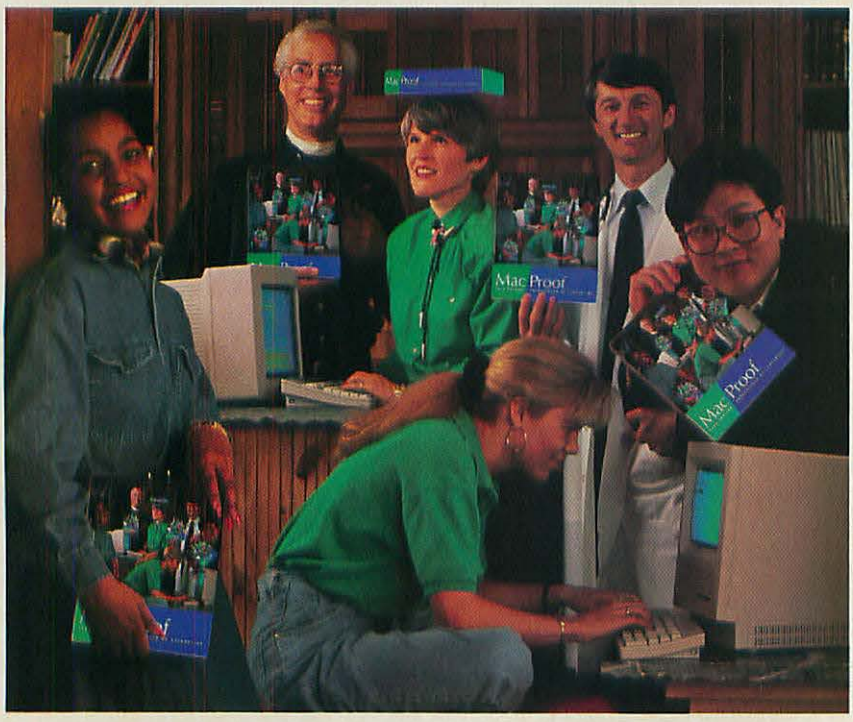
Utilities The Expo could have been renamed The Utility Show, with major new bundled packages from Peter Norton and from Now Software (formerly SmethersBarnes). With Symantec's SUM passing 7000 units of sales per month, many developers have acquired a new appreciation for the utility market, particularly for bundled groups of products. We'll have to see what changes the unification of Peter Norton and Symantec will bring on the companies' respective product lines—the merger now makes the pair a single company of nearly $70 million in revenues. Casady & Greene announced a new collection of utilities called QuickTools, and Central Point announced MacTools Deluxe. It's getting to be tough to pick the best package (see "An Exercise in Utilities," this issue).

Music One application market in which the Mac is the undisputed CPU of choice is music. The Expo featured new releases for all major Mac music products: Finale 2.0 and Music Prose (both from Coda), EZ-Vision and Studio Vision (Opcode), Ars Nova 2.2 (Ars Nova Software), Clip Tunes (from Digidesign, really neat) and MacProteus (also from Digidesign), and the latest release of Great Wave's ConcertWare+ MIDI.

CD ROM CD ROM discs appeared to have come into their own at the Expo. I especially liked Electronic Map Cabinet from Highlighted Data. Larry Shiller's Bureau of Electronic Publishing, has become the repository of all Mac CD ROMs. The company is in Parsippany, New Jersey, if you want to call Larry. Mike Saenz is back with a pornography disc that could have really been great (see *The Iconoclast,* this issue). The graphic environments, navigation, original music, and game-playing aspects make it the most progressive CD ROM work done to date, bar none. Its pornographic focus, however, relegates it to a sophomoric vertical market. Mike, apply yourself to a wider audience and you could help shape computing (and make more money).

Hardware I could spend another column on this area of Mac technology—but I'm going to do a fast review of my personal favorites. I love the thought of SCSI 3½-inch erasable disc drives. You'll see them. I talked with three companies that plan to ship them at the August Expo. They say 128MB on a single erasable disc? I'm ready. On the high end of storage, PLI and Pinnacle demonstrated 56- and 10-disc versions of optical jukeboxes; they look fast and seem reliable. I can't wait to get one in the lab and benchmark the machines. Now that would be backup.

(continues)



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Quantum	40	15	529	579	799	5
	50	15	599	659	899	5
	80	15	799	859	1099	5
	105	15	899	959	1199	5
	120	15	999	1059	1299	5
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Color Scanners Color Imaging Systems' (formerly known as Barneyscan) new multiple-aperture scanner is a winner. A boon to publishing, it accepts 35mm, 125mm, and 4-by-5-inch transparencies. When the scanner drops in price it will be *the* input device for publishing in general. Hurrah for innovation in small companies—these guys should win an award. Microtek announced an attachment for its scanners that appears to provide some competition for, and to be more reliable than, the current shipping version of transparency devices for the Sharp scanner line. I also liked the three hand-held color-input scanners from Mouse Systems, Blue Solutions, and NCL America.

Communications Connecting Macintoshes with Ethernet seemed to be the main comunications theme of the Expo. Farallon, National Semiconductor, Adaptec, AvantGarde Group, and Neon Software all had announcements. Avant Garde showed a neat product, Etherpeep, that allows analysis of Ethernet nodes much in the fashion of Farrallon's Net Analyzer. Neon also offered an Ethernet net analyzer.

Displays Low-cost-for-low-performance monitors and high performance for the NuBus were dual themes for display products and video boards. Ehman, Lite-On, and Mobius all demonstrated low-cost monochrome monitors. Mobius showed a monitor-accelerator combination for only $695. Aapps, after some false starts, finally began shipping its Digi-Video color board for $995. SuperMac had a bewildering array of new products for color and acceleration. Mass Microsystems announced the lowest-cost graphics-and-video combination board on the market at under $1000. RasterOps offered an accelerator for its 364 board. Radius showed its third-generation monochrome board for the first time, betting heavily that its innovative new product would help the company retain its leadership in monochrome and gray-scale products.

Printers Hewlett-Packard showed both color and black-and-white products at the show. Its LaserJet III may be the first real competition for Apple in the lucrative printer market. QMS showed a new version of its ColorScript (kanji model) and a new UltraScript that allows PostScript files to be output on dot matrix printers. GCC showed its PLP II, the current leader of QuickDraw printers in the Mac market.

What's New?

Too much—hundreds of products, most of which I haven't mentioned here. But the strength of the market, the keen interest of us ordinary mortals in observing the ongoing growth of this market, and the continuing delight of the average attendee with the progress of the Mac tell me that the dream and hope continue. Ⓜ

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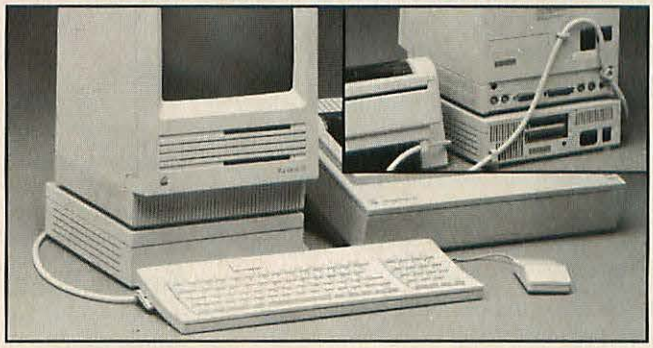
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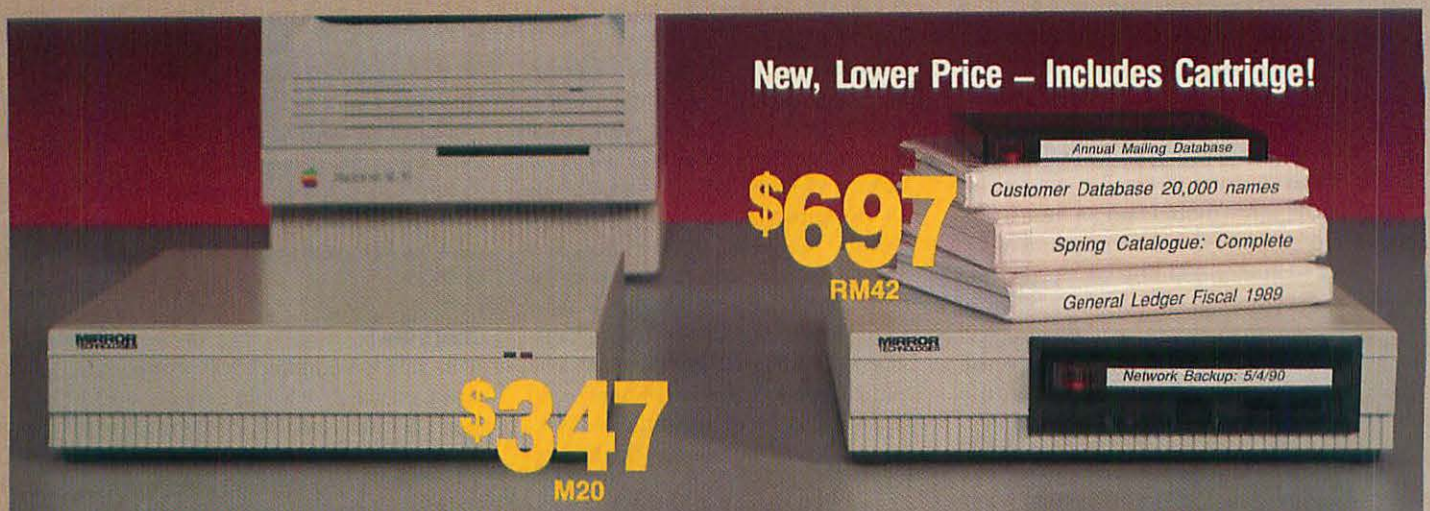
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580MP*	—	2497

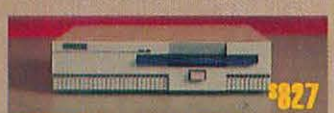
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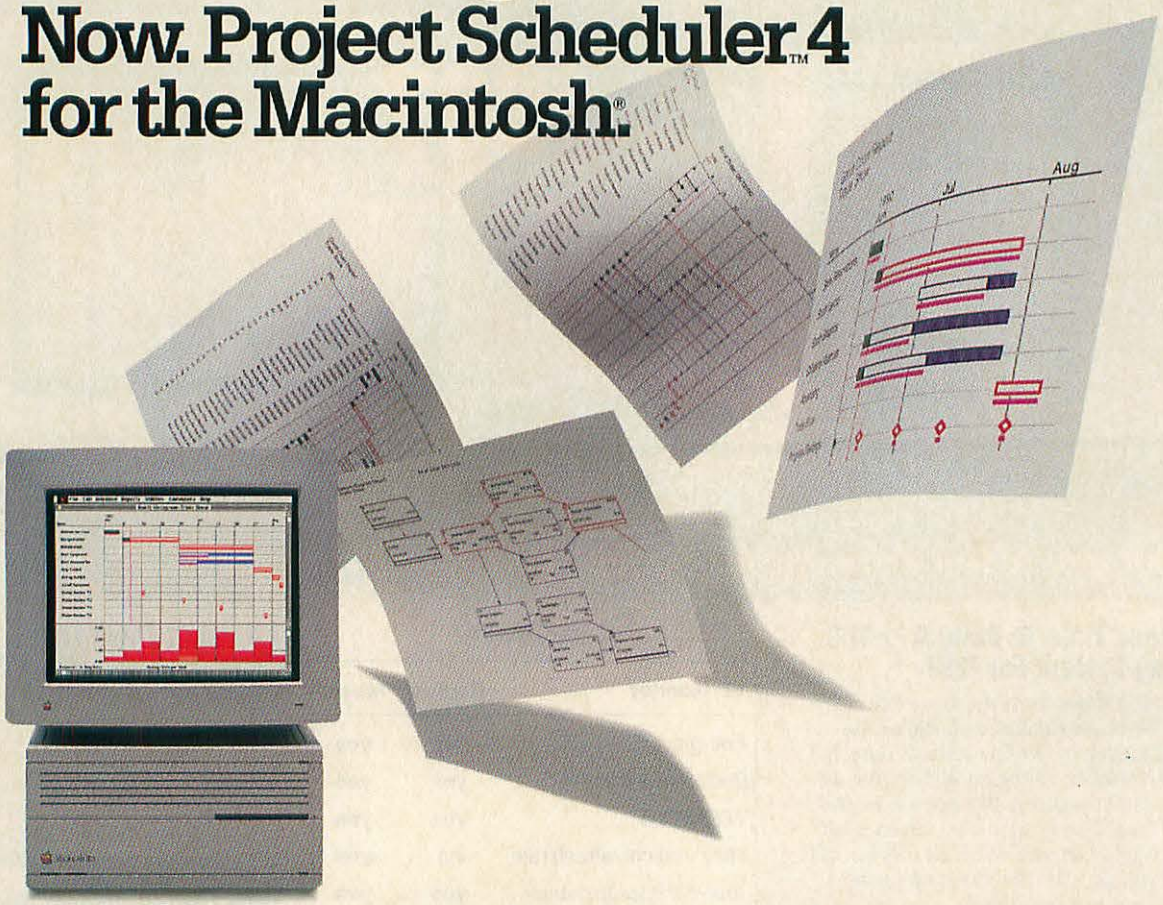
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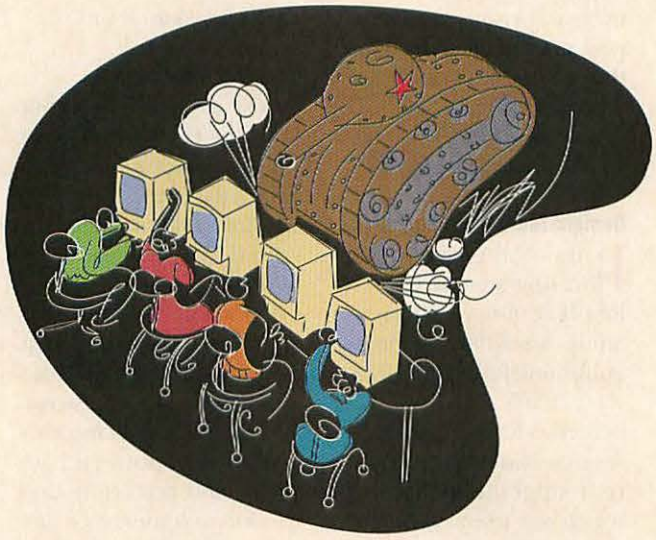
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LETTERS



MacGlasnost

The Macnost revolution Jerry Borrell refers to [*Commentary*, April 1990] really began over a year ago in the Baltic states, which are trying to reclaim freedom from a Soviet Union they never wanted to join. The Popular Front paper *Atmoda* in Riga uses Mac SEs and LaserWriters to lay out pages for weekly editions in Latvian, English, and Russian that go to some 200,000 subscribers and an estimated readership of three-quarters of a million. After meeting with Riga Mac club members in November, it was clear to me that the majority of organizations fighting for self-determination—such as the Popular Front, the Environmental Protection League, the Cultural Foundation, churches, and budding political parties—have made the Mac their weapon of choice. This is true elsewhere in the Soviet Union and Eastern Europe. Sajudis publications in Lithuania rely on the Mac. So will the Polish trade union Solidarity for its *Trybuna Wyborcza*.

All this has been supported by donations and imports. Despite repeated efforts to convince Apple Europe that this grass-roots movement represents an immediate market opportunity (since the Cyrillic Mac is not an issue), there has been no response. Meanwhile I cannot work up too much enthusiasm for Apple's efforts to cater to Big Brother in Moscow while tanks rumble through the streets of Vilnius.

Juris Mazutis
Ottawa, Canada

Polish Joke

During a recent visit to the United States, I read with great dismay your interview with Michael Spindler [*Verbatim*, May 1990]. When the chief operating officer of a major computer company says, "So far the needs of Poland are basic, like food and clothing," one only wonders what his source of information is. However, when he asserts that "Fiat licensed technology to the USSR to build Fiats, or Ladas as the Polish called their Fiats. Then Ladas began to be sold into the Italians' own markets at a cheaper price," one cannot stop laughing, especially here in Poland, where the first Polski Fiat was built more than sixty years ago.

Please do us a favor, instead of food and clothing, send more good jokes, like those of Michael Spindler.

Jakub Tatarkiewicz
Warsaw, Poland

Another View of Jasmine

I read with interest your article entitled "Gambling on Jasmine" [Conspicuous Consumer] in the May issue. Your readers deserve some additional insight into what happened.

I joined Jasmine in late 1987 as director of operations, was promoted to senior director of operations, and was then promoted to chief operating officer, a position I held until November 1988. My performance was characterized as "magnificent" and "superb," my efforts called "excellent" and "superhuman," and my contributions to the company described as "immeasurable." My supervisor, company president Dennis Chang, gave me favorable reviews, bonuses, and stock in the company.

While I was at Jasmine, our management team completely renovated the company's product line. As a result of our efforts Jasmine more than doubled its size

(continues)

Corrections

A/UX 2.0 does support true multitasking of multiple UNIX applications (Macworld News, *May 1990*).

DynoDex, the address-book manager by Portfolio Systems, retails for $99.95 (Reviews, *June 1990*).

The IIci requires a NuBus video board to work with the Apple Two-Page Monochrome Monitor ("Monochrome Monitor Mania," Gray-Scale Monitors table, April 1990).

Rolodex ("Roll Over Rolodex," May 1990) is a trademark of Insilco Corporation designating Insilco's brand of card files and other products.

suRge, by Museum Quality Solutions, is a surge protector for Macs and other computers on AppleTalk networks running on twisted-pair cables (not shielded LocalTalk cables). It retails for $49.95 (New Products, *June 1990*).

The sample output for the GCC Personal LaserPrinter II and the GCC WriteImpact were accidently switched ("Printing Without PostScript," page 178, June 1990).

PETER ALSBERG

and increased its profit margins.

However, something else was going on behind the scenes. As stated in my countersuit against Jasmine, I was fired to allow Dennis Chang and others "to sell stock in Jasmine at a premium price to defendant Rodime and/or other potential investors." When I and other senior managers would not assist Chang, we were demoted, terminated, and sued as coconspirators. Unfortunately, the company was then left in the hands of individuals who appeared to care little for Jasmine's future.

Jasmine's contention that its financial failure in 1990 is due to purported wrongdoings of our management team and vendor Rodime back in mid-1988 is a weak attempt to cover up the truth. The real losers in all of this are Jasmine's customers and vendors. I can only extend my sympathies to those who were victimized by what Jasmine became after we departed. Hopefully Jasmine will rise again under new management to fulfill the potential it once displayed.

Bryan Speece
San Francisco, California

DesignStudio Upgrade Path

In your May issue you said the upgrade path from ReadySetGo to DesignStudio was $100 ("Picking a Publishing Program"). This was actually a special time-limited offer for registered ReadySetGo users. The current upgrade policy for registered users who purchased ReadySetGo between February 1 and March 31, 1990, is $295, while those who bought ReadySetGo before February 1 may upgrade to DesignStudio for $150.

Michelle Blank
Letraset
Paramus, New Jersey

The New Smartcom II

Just a comment about Larry Loeb's review of telecommunications products in the June issue ("Calling Information"). Smartcom II 3.01c was reviewed although 3.1c is the current version. It adds better scripting capabilities, text buttons to which you can assign autopilots (these can be displayed simultaneously with icon buttons and are handy and powerful), and Ymodem/Ymodem-G file-transfer capabilities.

Tim Winders
Baltimore, Maryland

Multi-Misnomer

Your feature "Multimedia: Is It Real?" [April, 1990] begins, "Buzzwords intrigue but rarely inform." This is especially true with multimedia because we've been using the word incorrectly. A better buzzword would be *hypermedia.*

The word *media* is plural, making the term *multimedia* redundant. Moreover, multimedia has already been widely applied in a much different sense to the entertainment industry. So, to use multimedia as we are doing here is not only sloppy but inaccurate. However, it may be just mushy and comfortable

(continues)

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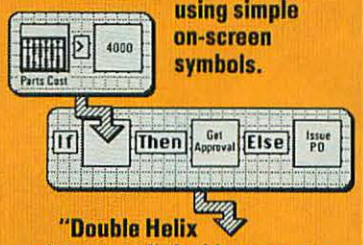
"Managing 4 or 5 projects like that can mean a paper trail of over 600 forms at a time. All with pen and paper. I knew I had to do something."

So Ric looked into a database program for his Macintosh.® "I chose Double Helix® because I didn't want to learn a programming language.

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Circle 352 on reader service card

enough to prevail.
Glenn Ralston
Indianapolis, Indiana

Fat Macworld

OK folks, it's time to diet. While the boys in the advertising department are slapping each other on the back over all the revenue-producing pages they've sold, your unfortunate readership is groaning under the weight and bulk of a magazine that has bloated to phone-directory size. Is it worth the hassle of wading through 524 pages for perhaps 100 pages of actual content? I think not.

Adding a bound-in 75-page MacConnection catalog to the tear-out MacAvenue ads can only be seen as greed piled upon avarice, and all for naught. Keep in mind that without readers you have no excuse for selling advertising space, and there is no better way of driving away your readership than sacrificing their interests to the quest for the almighty buck. Free the oppressed pages and return them to their rightful owners: your excellent lineup of writers.
Edward Arnold
Chicago, Illinois

Fontastic Article

Thanks for writing the definitive article on outline fonts ["Battle Royal," April 1990]; it was all I wanted to know about outline fonts but was afraid to ask.

To the font mongers who are already yelling "Down with Adobe," I say "Phooey on you!" I say the same to those who are shouting "Out with Apple," for introducing a new font technology. I'm for any product that is competitive in its industry. Until Apple rocked the boat, Adobe had a veritable monopoly on the outline font market, and you didn't see it giving any of its hints away.

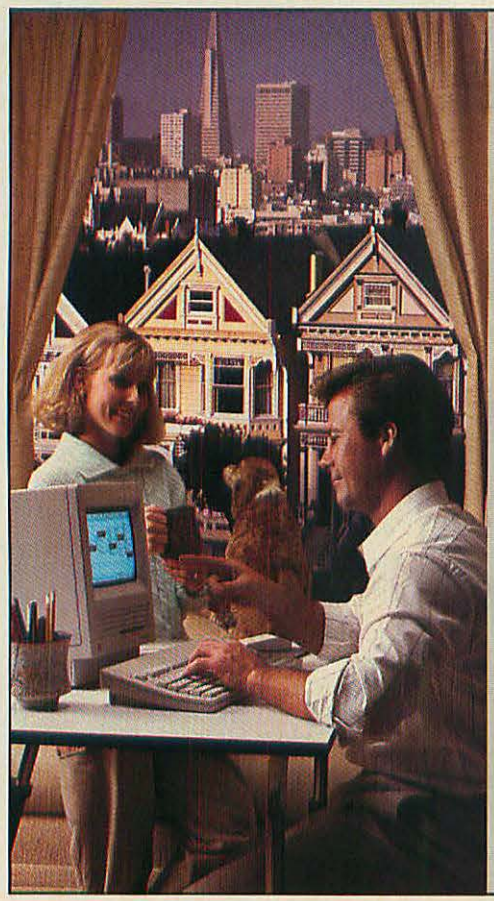
If Apple is attempting to bring outline fonts into my home at a price I can afford, I'm all for it. PostScript users shouldn't complain; they have had a good thing that will be useful for quite a while, unless Adobe abandons PostScript (yeah, right).
Thomas A. Martin
Brooklyn, New York

IIci Performance

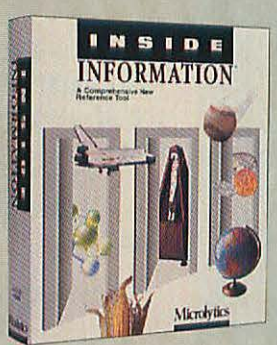
There is no doubt that the IIfx is the new performance leader ["Power at a Price," May 1990]. However, to question the IIci's future niche without including its best performance option was puzzling.

Your own graph ["Pushing the Mac II Performance Envelope," February 1990] indicates that the Mac IIci with a cache board was the standout price/performance leader. Performance increases of 40 to 80 percent over the stock IIci were indicated in 1-bit mode. Since a lot of important applications, such as spreadsheets, databases, and word processors, do not require gray scale or color, they can enjoy the benefit of that speed. So can CAD and graphics applications, if black and white is sufficient. Thus a $995 cache-board upgrade to the IIci appears to bring it much of the way to IIfx performance at only about 25 percent of the price difference. In addi-

(continues)



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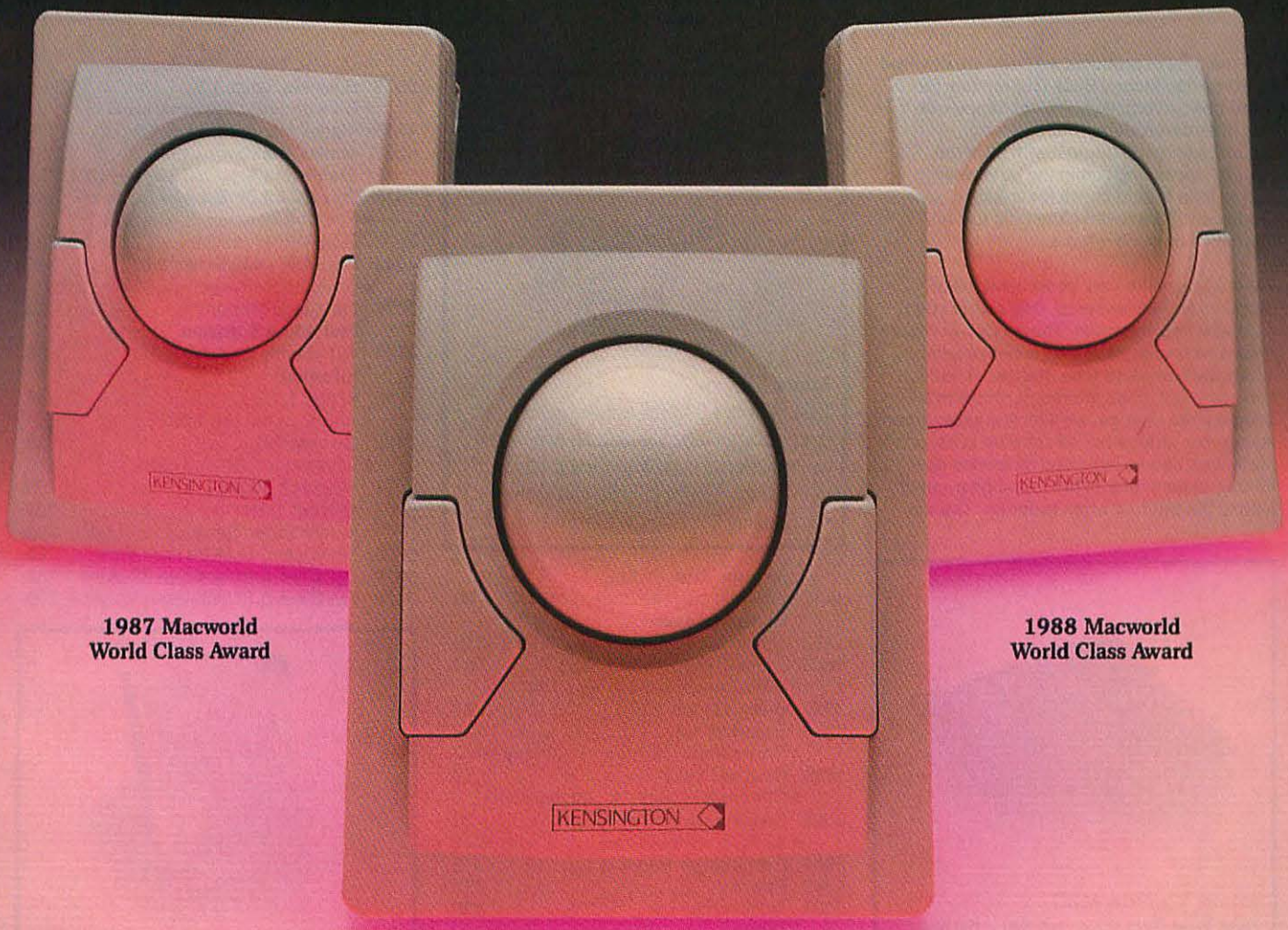
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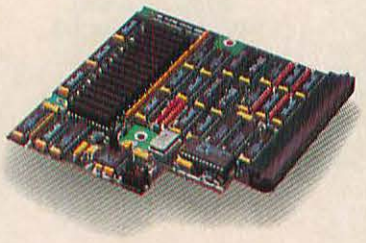
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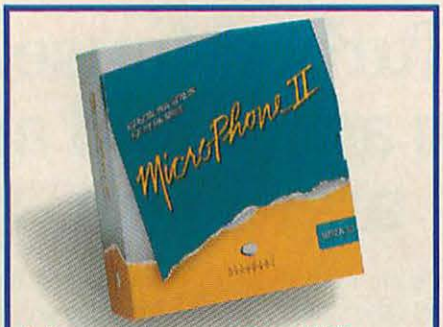
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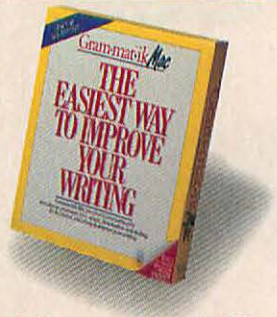
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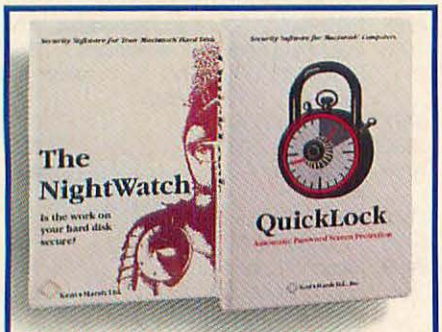
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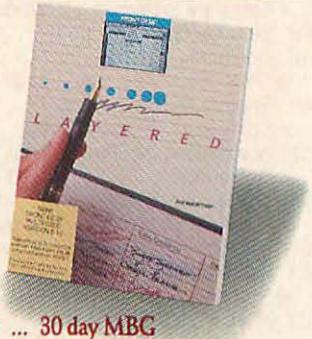


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4719 101 Scripts & Buttons HyperCard 1.0. 35.
★Leister Productions ... 30 day MBG
7126 Reunion..... 89.
★Manx Software ... 60 day MBG
4075 Aztec C + SDB 3.6B..... 95.
★MicroMaps ... 30 day MBG
5512 HyperAtlas 1.0..... 59.
★Microsoft ... 30 day MBG
4471 QuickBasic 1.0..... 64.



Layered ... 30 day MBG
FrontDesk 6.10 Multi-User–Comprehensive office scheduler lets you create multiple 12-month calendars with up to 30 resources each–people, conference rooms, delivery trucks, whatever you need to schedule **see line listing.**

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★Millenium Software ... 30 day MBG
6105 HyperX 3.0 ... $65.
★Now Software ... 30 day MBG
6739 Prototyper 2.1 ... 185.
★Silicon Beach ... 60 day MBG
5100 SuperCard 1.5 ... 189.
6703 Inside SuperCard *(Microsoft Press)* ... 17.
★Softstream Int'l., Inc. ... 30 day MBG
6513 Authenticate & Mutate ... 79.
5440 HyperHIT 2.2 ... 125.
★Somak Software ... 30 day MBG
5897 ScriptEdit 1.1 ... 49.
★Spinnaker ... 30 day MBG
6692 PLUS 2.0 ... 115.
★Symantec ... 30 day MBG
4644 Just Enough Pascal 1.0 ... 52.
3421 THINK Pascal 3.0 ... 165.
3420 THINK C 4.0 ... 165.
★Symmetry ... 30 day MBG
3318 HyperDA 1.2 ... 45.
★TGS Systems ... 30 day MBG
6667 Prograph 1.2 ... 125.
★TML Systems ... 30 day MBG
3549 TML Pascal II 3.1 *(w/MPW 3.1)* ... 109.
Trendware
HyperTools #1 or #2 ... *each* 52.
True BASIC, Inc.
3587 True BASIC 2.02 ... 55.
★Zedcor ... 60 day MBG
3985 ZBasic 5.0 ... 88.



HJC/Microcom ... 30 day MBG
4803 *Virex with the Virex INIT*–Both detects and repairs files infected by all known Macintosh viruses. The Virex INIT continuously monitors the computer to prevent infection ... $56.
5885 *Virex 10 Pack* ... 329.

UTILITIES

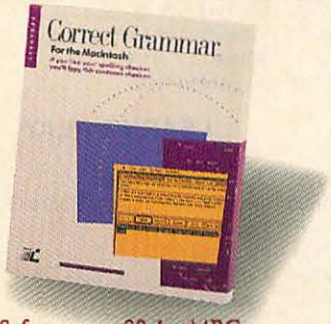
★Abbott Systems ... 30 day MBG
5236 CanOpener 1.1 ... 63.
★Affinity Microsystems ... 60 day MBG
1016 Tempo II 1.02 ... 93.
★Aladdin Systems ... 30 day MBG
6169 Shortcut 1.0.2 ... 46.
6740 StuffIt Deluxe 1.0 ... 63.



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6069 *KeyPlan 1.0*–1989 MacUser Editors' Choice Award for *Best Information Management Software*. All the tools necessary to create, analyze, fine-tune, present and track plans from outline to deadline ... $243.

★ASD Software ... 30 day MBG
7085 FileGuard Extended 2.5 *(1 user)* ... 145.
★Berkeley Systems ... 30 day MBG
5737 After Dark 1.1C ... 22.
1541 Stepping Out II 2.02 ... 49.
★Bravo ... 30 day MBG
5404 SPAMM 1.1 ... 48.
★Casady & Greene ... 60 day MBG
2269 QuickDEX 1.4D ... 31.
★CE Software ... 60 day MBG
4689 MockPackage Plus Utilities 4.4 ... 31.
1727 CalendarMaker 3.0 ... 31.
6278 DiskTop 4.0 ... 63.
1729 QuicKeys 1.2 ... 63.
★Central Point ... 30 day MBG
5040 Copy II Mac 7.2 ... 23.
5041 Mac Tools Deluxe 1.1 ... 75.
★Connectix ... 30 day MBG
6123 Virtual 2.03 (for SE/30, IIcx, IIx, & IIci) 115.
6122 Virtual 2.03 (for Mac II, incl. PMMU) ... 188.
★Dantz Development ... 30 day MBG
5255 Retrospect 1.1 ... 149.
Dubl-Click Software
6653 MenuFonts 3.0 ... 30.
1824 Calculator Construction Set 2.05 ... 45.
★Electronic Arts ... 30 day MBG
1843 Disk Tools Plus 1.01 *(Batteries Incl.)* ... 31.
★Fifth Generation ... 30 day MBG
4287 PYRO! 4.0 *(screen saver)* ... 25.
3954 PowerStation 2.5.2 ... 37.
3955 Suitcase II 1.2.5 ... 49.
5178 FastBack II 2.1 ... 118.
5725 DiskLock 1.0.2 ... 118.
★HJC/Microcom ... 30 day MBG
4803 Virex *(lastest version)* ... 56.
5885 Virex *(10 Pack)* ... 329.
ICOM Simulations
4084 On Cue 1.3 ... 35.
★Insight Development ... 30 day MBG
6171 MacPrint 1.2 ... 94.

★JAM Software ... 30 day MBG
6089 Smart Alarms w/Appt. Diary 2.9.1 ... $49.
6088 Smart Alarms 3.02 *(1-4 users)* ... 99.
6087 Smart Alarms *(5-8 users)* ... 149.
6086 Smart Alarms 3.02 *(9-15 users)* ... 199.
★Kent Marsh Ltd. ... 30 day MBG
5457 QuickLock 2.0 ... 34.
2591 The NightWatch 1.03 ... 85.
6134 MacSafe II ... 107.
★Kiwi Software ... 60 day MBG
6267 KiwiEnvelopes! 3.0 ... 34.
★Loop Software ... 30 day MBG
5442 PictureBook 3.2 ... 39.
Magic Software
7267 AutoSave II 1.1 ... 28.
7268 POWERicons 1.0 ... 39.
7269 POWERmenus 1.1 ... 39.
7270 Backmatic 1.1 ... 50.
★Microlytics ... 60 day MBG
2732 GOfer 2.0 ... 45.
★Microseeds Pub. ... 60 day MBG
7068 INITPicker 2.0 ... 35.
4210 Screen Gems 1.0 ... 39.
2913 Redux 1.62 ... 49.
7116 Rival 1.1 ... 49.
★Now Software ... 30 day MBG
6924 ScreenLocker 1.0 ... 45.
6925 Now Utilities 1.0 ... 89.
Olduvai
4503 MultiClip 2.0 ... 49.
★ON Technology ... 1 year MBG
6385 On Location 1.0 ... 75.
★Peter Norton ... 30 day MBG
6748 Norton Utilities for the Mac 1.0 ... 84.
★Software Innovations ... 30 day MBG
5869 HandOff 1.1 ... 31.
6647 HandOff II ... 52.
★Solutions, Inc. ... 60 day MBG
3448 SmartScrap & The Clipper 2.1 ... 45.
3449 SuperGlue II 2.01 ... 61.



Lifetree Software ... 30 day MBG
6984 *Correct Grammar 1.0*–Rated top grammar checker (4½ Mice) by *MacUser* (6/90). Checks each sentence & highlights mistakes in grammar, style, punctuation & spelling. Suggests corrections before your boss does ... $51.

190C

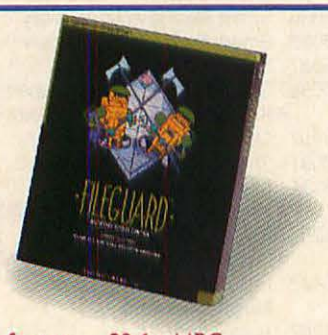
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MacConnection®

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Pointing is rude,



ASD Software ... 30 day MBG

7085 *FileGuard Extended 2.5*–Protect your hard drives, applications, files/folders (including system folder) from unauthorized access, deletion, and/or illegal copying. Now with system usage audit trail..... $145.

★SuperMac Tech. ... 60 day MBG

3383 SuperSpool 5.0 58.
3382 SuperLaserSpool 2.02 87.
3378 SuperLaserSpool 5-Pack 2.02 ... 289.
3377 DiskFit 1.5 58.
3379 Network DiskFit 1.5..... 225.
3381 Sentinel 2.0 87.

★Symantec ... 30 day MBG

5176 Symantec AntiVirus for Mac *(S.A.M.)*.. 67.
5724 Symantec Utilities for Mac *(S.U.M.)* ... 99.

★Synex ... 30 day MBG

6665 MacPhonebook 2.0 51.
7147 MacEnvelope 5.0 57.
6666 MacEnvelope Plus 2.0 159.

★Williams & Macias ... 30 day MBG

6926 myDiskLabeler III 3.0 49.
3780 ImageWriter II Label Pack *(Qty. 216)* 15.
3781 LaserWriter Label Pack *(Qty. 216)* .. 18.
4976 StickyBusiness 1.2 89.
6927 StickyBusiness Plus 1.2 149.

XTree

5177 XTreeMac 1.02 50.

LEARN & PLAY

Access Software

4655 World Class Leader Board Golf.... 25.

Accolade

1184 Hardball *(CP)* 26.
4484 Mean 18 *(CP)* 26.
4485 4th and Inches *(CP)* 26.
6760 Test Drive II-The Duel *(CP)*..... 31.

Activision

4475 Quarterstaff *(CP)*..... 28.
4486 Manhole..... 28.
5127 Manhole *(CD-ROM)* 34.
5517 Cosmic Osmo..... 40.

★Ars Nova ... 30 day MBG

1215 Practica Musica 2.2 69.

★Bogas Productions ... 60 day MBG

4255 Super Studio Session 2.0 65.
6135 Super Studio Session & Complete Music Library 99.

Bright Star Technology

3961 Talking Tiles 1.0 26.
1402 Alphabet Blocks 1.0 30.

Broderbund Software

4314 Type! 1.0..... 18.
5886 Star Wars *(CP)* $23.
4099 Shufflepuck Cafe *(CP)*..... 23.
1421 Ancient Art of War *(CP)*..... 26.
4540 Ancient Art of War at Sea *(CP)*..... 26.
6516 The Playroom *(CP)* 29.
4229 Where/World Carmen Sandiego? *(CP)* 29.
5755 Where/Europe Carmen Sandiego?*(CP)* 29.
5233 Where/USA Carmen Sandiego? *(CP)* 29.
6384 PlayMaker Football *(CP)* 29.
4966 SimCity 1.1 *(CP)* 29.
5871 SimCity Supreme 47.
6515 SimCity Terrain Editor 16.
1422 Geometry 1.2 *(CP)* 58.
4067 Calculus 1.2 *(CP)* 58.
1426 Physics 1.2 *(CP)* 58.

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5841 Moriarty's Revenge *(CP)*..... 32.

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1545 Fokker Triplane 2.02 *(CP)* 23.
1544 Ferrari Grand Prix *(CP)* 31.
4074 P51 Mustang Flight Simulator *(CP)* . 31.

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5726 Voyager 1.2 89.



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6517 *Freedom of Press 2.1A*–1989 MacUser Editors' Choice Awards for *Software Product of the Year* and *Best Graphics/Publishing Utility*. Brings PostScript-printing capabilities to non-PostScript output devices..... $255.

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2268 Crystal Quest 2.2X 25.
4119 Crystal Quest w/Critter Editor 2.2X . 39.

Coda Music Systems

5854 MusicProse 1.01..... 187.
5604 Finale 2.0..... 559.

Davidson & Associates

1734 Math Blaster! 1.0 *(CP)*..... 29.
6128 Math Blaster Mystery *(CP)*..... 29.
4978 Speed Reader II 1.0 *(CP)* 29.

★Electronic Arts ... 30 day MBG

6716 Pipe Dreams..... 17.
1850 Reach for the Stars 3.0 26.
6297 Halls of Montezuma 26.
6663 Sands of Fire 32.
5554 Bard's Tale 32.
4064 Chuck Yeager Flight Simulator 32.
4981 Starfleet 1..... 36.
6594 Starflight..... 39.
1846 Deluxe Music Construction Set 2.5 . 84.

★First Byte ... 30 day MBG

5294 Puzzle Storybook 1.0 *(ages 3-8)* ... 27.
5293 Dinosaur Discovery Kit 1.0 *(ages 3-8)*. 27.
3941 Smooth Talker 3.0..... 32.
3936 KidTalk 2.0 *(ages 5-15)* 32.

★Great Wave ... 30 day MBG

2276 KidsTime 1.2 *(ages 3-8)* $26.
5642 KidsMath 1.1 *(ages 3-8)* 26.
4334 NumberMaze 1.1 *(ages 5-12)* 26.
2270 American Discovery 2.3 *(ages 9 +)*. 26.
2273 ConcertWare + 4.0..... 38.
2271 ConcertWare + MIDI 5.1 98.

★HyperGlot ... 30 day MBG

Word Torture - Beginner to Advanced *(Span., Fren., Germ., Ital. & Rus.)* ea. 29.
Pronunciation Tutor - Beginner *(Spanish, French, German)* ... ea. 35.
Verb Tutor - Intermediate *(Spanish, French, German)* ... ea. 42.
6604 Verbal Aspect - Inter. *(Russian)* 42.
6611 Kanjimaster - Beg. *(Japanese)*. 105.

★Inline Design ... 30 day MBG

5870 Bomber 1.3 *(includes headphones)* 26.

★Knowledge Revolution ... 90 day MBG

7310 Interactive Physics 169.

★Learning Company ... 30 day MBG

2670 Reader Rabbit 2.2 *(CP) (ages 4-7)*.. 30.
5453 Talking Math Rabbit 1.0 *(ages 4-7)* . 30.

MicroProse

4697 Pirates! *(CP)* 35.

★Microsoft ... 30 day MBG

2868 Flight Simulator *(CP)*..... 32.

Miles Computing

5253 The Puzzle Gallery 26.
2765 Fool's Errand 32.
2767 Harrier Strike Mission II *(CP)* 32.

Mindscape

4083 Balance of Power 1990 *(CP)* 29.
3987 Colony *(CP)* 29.
4596 Deja Vu II *(CP)* 29.
2743 Crossword Magic *(CP)* 29.
2749 Shadowgate *(CP)* 29.
2751 Uninvited *(CP)* 29.

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5864 VocabuLearn/ce French *(level I)* ... 29.
5887 VocabuLearn/ce French *(level II)*... 29.
5865 VocabuLearn/ce Italian *(level I)* 29.
5889 VocabuLearn/ce Italian *(level II)*.... 29.
5867 VocabuLearn/ce Spanish *(level I)* .. 29.
5891 VocabuLearn/ce Spanish *(level II)*.. 29.
5868 VocabuLearn/ce German *(level I)* .. 29.
5888 VocabuLearn/ce German *(level II)*.. 29.
6639 VocabuLearn/ce Russian *(level I)*... 29.



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5858 *Microsoft Mail 2.0 Workstation*..... $83.
5856 *Microsoft Mail 2.0 Server*..... 245.

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5866 VocabuLearn/ce Japanese *(level I)* . 35.
5864 VocabuLearn/ce Japanese *(level II)*. 35.

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Personal Training for Excel 2.2
5573 XL1 Beginning Spreadsheets 36.
5574 XL2 Intermediate Spreadsheets . . . 36.
5575 XL3 Advanced Spreadsheets 36.
5576 XL4 Creating Business Graphics. . . 36.
6021 XL5 Building Databases 36.
6020 XL6 Beginning Macros 36.
6367 XL7 Advanced Macros 36.

Personal Training for Macintosh
5263 B1 The Basics *(for 2 floppy drives)*. . 36.
5264 B2 The Basics *(for Plus or SE w/HD)* 36.
5265 B3 The Basics *(for Mac II w/HD)* . . . 36.
5266 B4 Beyond the Basics. 36.

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4947 W1 Beginning Level 36.
4854 W2 Intermediate Level 36.
5098 W3 Advanced Level 36.
5418 W4 Additional Features. 36.

Personal Training for Persuasion
5269 LP1 Beginning Persuasion 36.
5270 LP2 Intermediate Persuasion 36.
5271 LP3 Creating Auto Templates 36.
5272 LP4 Creating Artwork 36.

Personal Training for HyperCard
5194 H1 Using HyperCard 36.
5195 H2 Creating Cards & Stacks 36.
5267 H3 Basic Scripting 36.
5268 H4 Advanced Scripting. 36.

Personal Training for PageMaker
4852 P1 Beginning PageMaker. 36.
4853 P2 Intermediate PageMaker 36.
5096 P3 Tips & Techniques 36.
5097 P4 Advanced Features 36.

Personal Training for Works
5196 M1 Database & Form Letters $36.
5197 M2 Advanced Databases 36.
5273 M3 Spreadsheets 36.
5274 M4 Word Processing 36.

Personal Training for Illustrator 88
5259 A1 Beginning Illustrator 36.
5260 A2 Intermediate Illustrator. 36.
5261 A3 Creating Special Effects. 36.
5262 A4 Precision Drawing Techniques. . 36.

Personal Training for FileMaker
5278 FM1 Beginning FileMaker. 36.
5279 FM2 Intermediate FileMaker 36.
5280 FM3 Advanced FileMaker. 36.
5281 FM4 Tips & Techniques. 36.

Personal Training for FreeHand
6353 FH1 Beginning Level 36.

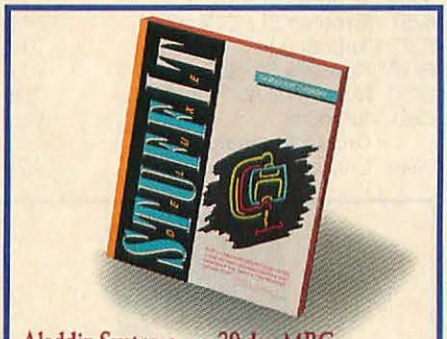
Postcraft
6466 Citadel 27.

Premier Technology
5773 Strategic Conquest Plus 2.0 34.
5774 NetTrek—The Real Version 2.3 34.

Sierra On-Line
3397 Leisure Suit Larry *(CP)* 23.
5694 Manhunter: San Francisco *(CP)* . . . 28.
5458 Manhunter: New York *(CP)* 28.
3394 King's Quest *(CP)* 28.
3396 King's Quest III *(CP)* 28.
3398 Police Quest *(CP)* 28.
3399 Space Quest *(CP)*. 28.
3400 Space Quest II *(CP)* 28.

★Silicon Beach ... 60 day MBG
3501 Apache Strike 1.1 32.
3502 Beyond Dark Castle 32.
3503 Dark Castle 1.1. 32.

★Softstream Int'l., Inc. ... 30 day MBG
4071 Mac•Man. 23.
4995 Cribbage Tutor 26.
6258 MacRummy 32.
4073 Colour Billiards. 38.



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6740 *StuffIt Deluxe 1.0*–The new generation of the standard for compression, security, and archiving software has over 75 new features. Includes "Magic Menu" Finder extensions for working from Apple's Finder **$63.**

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4945 The Hunt for Red October 1.1. . . . $20.
1842 Chessmaster 2100 1.1 28.
4619 Mavis Beacon Typing 1.3 *(CP)* 32.
4588 Life & Death *(CP)* 32.
6111 Cribbage King-Gin King 39.

★Spectrum Holobyte ... 30 day MBG
4001 Solitaire Royale *(for Mac II & SE)* . . . 19.
3464 Tetris 1.1 *(for Mac II & SE)* 19.
6112 Welltris *(for Mac II & SE)*. 19.
3462 PT-109 25.
3459 Falcon 2.2 30.



Preferred Publishers ... 30 day MBG
5751 *Exposure 1.03*–The only screen capture utility that offers full black and white and color paint editing of your screen. Captures virtually any image on all Macintoshes . **$52.**

★Spinnaker ... 30 day MBG
2328 Sargon IV *(CP)* 28.
2329 SAT Score Improvement 1.0 *(CP)* . . 57.

★SubLogic ... 60 day MBG
4698 Jet *(CP)*. 31.

★Think Educational ... 60 day MBG
3615 MacEdge II 1.0 *(CP) (ages 6-12)* . . . 27.

True BASIC, Inc.
3571 Algebra 3.02 *(with workbook)* 45.
3580 Pre-Calculus 3.02 *(with workbook)* . 45.
3575 Calculus 3.02 *(with workbook)* 45.
6110 Algebraic Proposer 2.0. 45.

★Unicorn ... 30 day MBG
3751 Animal Kingdom *(CP) (ages 6-12)* . . 27.
3756 Math Wizard *(CP) (ages 5-10)* 27.

★Wayzata Tech. ... 60 day MBG
6369 The World Factbook 1989 *(CD-ROM)* 69.

★XOR ... 30 day MBG
6152 TaskMaker *(CP)*. 27.
6038 Road Racer *(CP)*. 38.
6040 MacGolf Classic *(CP)* 52.
3815 NFL Challenge 1.2 *(CP)* 55.

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★Abaton ... 30 day MBG
4589 InterFAX 12/48 Modem. 265.
6266 InterFAX 24/96 Modem. 419.

190C

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5638 In/Out *(10 user)* $187.
5174 QuickMail 2.2 *(5 user)* 215.
5173 QuickMail 2.2 *(10 user)* 315.

★CompuServe ... 60 day MBG

1676 CompuServe Information Service . . 23.
1673 CompuServe Navigator 3.0 49.
1674 Standard Service/Navigator Bundle 69.

Connect, Inc.

5834 Connect 1.5 for the Macintosh 63.

★DataViz ... 60 day MBG

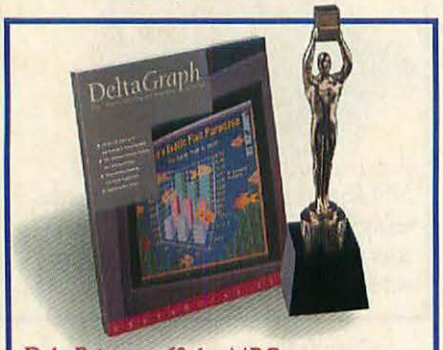
1823 MacLink Plus/PC 4.5. 119.
4842 MacLink Plus/Translators 4.5 99.

★Dove Computer ... 60 day MBG

6758 DoveFax Desktop. 279.
4939 FastNet III. 375.
4938 FastNet SE 375.
5624 FastNet SE/30. 375.

★Dow Jones ... 30 day MBG

5295 News/Retrieval Membership Package 24.
1785 Desktop Express 1.03 95.



DeltaPoint ... 60 day MBG

6095 *DeltaGraph 1.5*–1989 MacUser Editors' Choice Award for *Best Presentation Product*. A charting package with the flexibility and power to create captivating charts and dramatic graphics, all in one program $97.

★Farallon Computing ... 30 day MBG

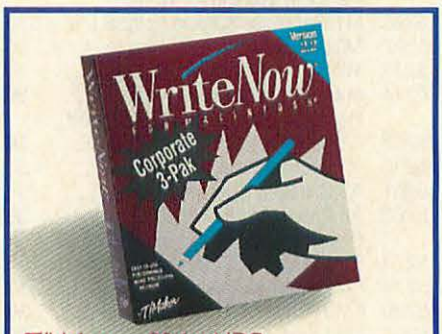
5707 Timbuktu 3.1 95.
4866 Timbuktu/Remote 1.0.1 123.
6371 Timbuktu/Remote Access Pack . . 849.
4867 Timbuktu 30-Pack 3.1. 1285.
2201 TrafficWatch 1.08. 125.
2202 PhoneNET to LocalTalk Adapter 8.
5664 PhoneNET StarConnector. 17.
6273 PhoneNET StarConnector 10-Pack . 129.
2203 PhoneNET Connector *(DIN-8)*. 31.
4869 PhoneNET Connector 10-Pk *(DIN-8)* 198.
5251 PhoneNET CheckNET. 64.
4868 PhoneNET Repeater 315.
2206 PhoneNET StarController 300. 825.
6687 PhoneNET StarController-EN 1599.
5893 Portable Pack *(incl. two copies each of Timbuktu & Timbuktu Remote, two StarConnectors, and accessories)*. 329.
6778 Remote/Wakeup Cable. 33.
6766 MediaTracks. 189.
6767 MediaTracks Multimedia CD Pack . 319.
6768 MediaTracks Multimedia Pack. . . . 319.

★Freesoft ... 60 day MBG

6115 White Knight 11.6 85.

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2300 Smartcom II 3.1C 84.
2307 Smartmodem 2400. 349.



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7360 *WriteNow 2.2 Corporate 3-Pak*–Special limited time offer! Thru August 31st, 1990 get three copies of this two-time Eddy award winning word processor for over 55% off full retail. Compatible with Microsoft Word $245.

6654 V2400 Internal Modem w/software . call
6655 V2400 Baud Modem 469.
5991 V9600 Baud Modem 759.

Insignia Solutions

7058 SoftPC-AT/EGA Module 125.
4089 SoftPC 1.3 245.
6688 SoftPC for the Mac Portable 245.

Intel Corporation

5119 2400EX Modem 179.
6265 2400EX with QuickLink II 195.
6420 2400EX MNP Modem. 229.
6650 2400EX MNP with QuickLink II . . . 249.

★Microsoft ... 30 day MBG

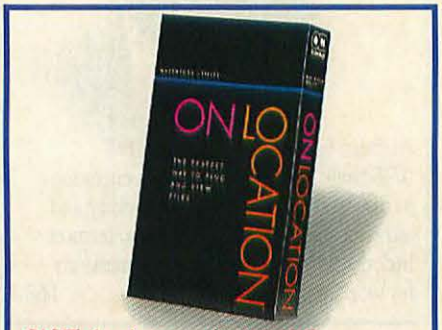
5858 Microsoft Mail 2.0 Workstation. 83.
5856 Microsoft Mail 2.0 Server. 245.
5857 Microsoft Mail 2.0 *(20 pack)* 965.

★Nuvotech ... 60 day MBG

3000 TurboNet ST *(DIN-8)* 30.
6751 TurboNet ST *(12-Pack)*. 279.
5277 TurboBridge 319.
6272 NuvoLink SC *($25 rebate)* 319.
6750 NuvoLink II *($25 rebate)* 279.
6261 TurboStar 1095.

Orchid Technology

6949 OrchidFAX Modem. 459.



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6385 *On Location 1.0*–This DA is the fastest way to find and view files. Find files by name or specific words they contain. Then view and copy text, including fonts and styles. Open, move, copy, rename, delete files $75.

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3102 2400 Baud External Modem $179.
5285 PM 2400SA MNP Modem 209.
3089 Mac Communications Pack 1.5 . . 225.

★Shiva ... 30 day MBG

3444 NetSerial X232 275.
4347 NetBridge. 339.
4942 TeleBridge 339.
3443 NetModem V2400 435.
6917 NetModem V.32 1429.
6519 EtherGate. 1629.

★Software Ventures ... 30 day MBG

3455 MicroPhone II 3.0 215.

★Solutions, Inc. ... 60 day MBG

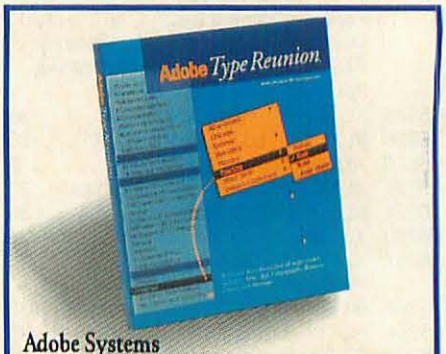
6721 MailMaker 5 User Pack 117.
4308 BackFAX *(reqs. Apple FAX modem)*. 139.
6720 FAXGATE Plus 239.

★Synergy ... 30 day MBG

6618 VersaTerm 4.1.1 88.
6619 VersaTerm-PRO 3.1.1 174.

★TOPS ... 30 day MBG

4188 TOPS Teleconnector *(DIN8)* 25.
4598 TOPS FlashBox. 118.
3720 TOPS Flashcard 155.
7057 MacPrint TOPS Network Version 1.0 165.
6264 TOPS Networking Bundle 3.0 187.



Adobe Systems

6957 *Adobe Type Reunion 1.0*–Just place Adobe Type Reunion in your system folder and your typefaces are automatically alphabetized and conveniently sorted by family name and weight. Once and for all. $39.

★Traveling Software ... 60 day MBG

3729 LapLink Mac III Connectivity Pac. . 119.
6741 LapLink Mac III Network Pac. 185.

INPUT/OUTPUT

★American Power ... 30 day MBG

5895 UPS 110SE. 209.
6686 UPS 370ci 339.

Apple Computer

6717 MIDI Interface. 84.
6714 Apple Hi Res Color 13" Monitor . . 849.
6719 Apple Portrait Display. 899.

Brother International

6934 HL-8PS Laser Printer 3299.

Caere

4476 OmniPage 2.1 539.
OmniSpell or OmniDraft . . . *each* 69.
OmniTrace or OmniProof. . . *each* 105.

★CoStar ... 30 day MBG

6090 LabelWriter. 185.
6067 LabelWriter Labels 11.



"Momma, hang up my walking shoes."

Dear MacConnection,

I'll admit it. I was unfaithful, but now I've come back. I first bought from MacConnection when the ads were black and white and one page long, and you could count Macintosh software on one hand. Then somewhere along the line I went astray. I allowed myself to be tempted by the empty promises of other companies for programs that never seemed to be in stock and never arrived. But I'm back because no one else gives as much dependable value and service. Momma, hang up my walking shoes, I'll never stray again.

John Sunami
Columbus, OH

1-800/334-4444

MacConnection®

MacConnection, 14 Mill Street, Marlow, NH 03456 1-800/334-4444 603/446-7711 FAX 603/446-7791

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Just for the record, all the ads in this series feature photographs of real live MacConnection customers and the real live letters they wrote us. Really!

Have fun in the sun!

1114 LaserWriter Plus Toner Cartridge . . $99.
1115 LaserWriter II Toner Cartridge 105.

★Avery ... 60 day MBG

4864 Disk Labels 3½" *(Qty. 250)* 13.
5392 Disk Labels 3½"-*Laser (Qty. 630)* . . 29.
5403 Address Labels 1⁷/₁₆" x 4" *(Qty. 1000)*. 9.
4865 Address Labels 3½" x ¹⁵/₁₆" *(3750)* 15.
4811 Transparencies 8½" x 11" *(Qty. 50)* 22.
4813 Round Labels 3⅓" *(Qty. 150)* 7.
4812 Laser Labels ½" x 1¾" *(Qty. 2000)* . . 7.
4807 Laser Labels 1" x 2⅝" *(Qty. 3000)* . . 24.
4808 Laser Labels 1½" x 4" *(Qty. 1400)* . . 24.
4809 Laser Labels 2" x 4" *(Qty. 1000)*. . . . 24.
4810 Laser Labels 8½" x 11" *(Qty. 100)* . . 24.
7049 Clear Labels 3½" x ¹⁵/₁₆" *(Qty. 500)*. 17.
7050 Clear Labels 1" x ⅝" *(Qty. 1500)* . . . 32.

★Basic Needs ... 60 day MBG

5635 Keyboard Flip 6.
Hard Top Keyboards *each* 15.
6682 Hard Top ImageWriter II 16.

★Computer Coverup ... 60 day MBG

1723 ImageWriter II Cover 8.
4657 LaserWriter II Cover. 10.
1720 Mac Plus Cover. 10.
1724 Mac SE Cover. 10.
1725 Mac SE Ext. Keyboard Cover set . . . 10.

★CoStar ... 30 day MBG

6091 The Organizer. 199.

Curtis Manufacturing

6733 GFP-3 *(Glass Filter Plus-Mac SE, Plus)* 65.
1683 SPF-4 Command Center. 93.

★Goldstein & Blair ... 30 day MBG

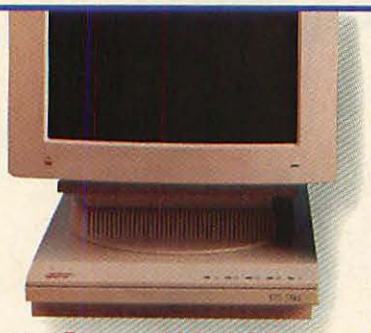
2267 The Macintosh Bible *(2nd Edition)* . . 19.

★I/O Design ... 30 day MBG

2379 MacLuggage Imageware II. 49.
2376 MacLuggage Macinware Plus 59.
2381 MacLuggage Macinware SE. 75.
6129 The Ultimate SE/Ext. Carrying Case 79.

★Kensington ... 30 day MBG

2577 Mouseway Pad. 7.
2569 Mac Plus/SE w/System Saver Cover . 9.
2589 Universal Printer Stand 15.
6722 LaserWriter II Security Kit 32.
2580 Mac II Stand 20.
4643 Mac II Stand and Cable Kit 64.
4941 Mac II Monitor Stand. 64.
6895 Mac IIcx Monitor Stand. 54.
2579 Mac II Monitor Cable Extension Kit . 32.



American Power ... 30 day MBG

6686 UPS 370ci–UPS system for Mac II series. Features automatic power-on and battery test routine when Mac is turned on. Includes built-in surge supression and advanced diagnostics with audible alarm $339.

2578 Extra Long ADB Keyboard Cable . $24.
2545 Universal Copy Stand. 22.
2573 Tilt/Swivel *(platinum)* 22.
4972 Power Tree 10 19.
4973 Power Tree 20. 27.
4974 Power Tree 50. 54.
2559 Apple Security Kit 33.
2568 Maccessories SuperBase 33.
2585 Printer Muffler 80 43.
4070 System Saver SE. 52.
2566 System Saver Mac *(platinum)* 63.
2567 System Saver Mac *(beige)* 63.
2546 A-B Box *(DIN-8)* 63.
6763 SE Radiation/Anti-Glare Filter 52.
5064 Apple Color Monitor Polarizing Filter 63.
5065 Full Page Display Polarizing Filter . . 63.
5066 Two Page Display Polarizing Filter . 135.
2561 Master Piece Mac II 105.
5894 PowerBacker 360 269.
5577 PowerBacker 450 339.
5578 PowerBacker 520 399.
5230 PowerBacker 800 749.

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4623 Solid Oak Disk Case *(holds 90 disks)* . 32.



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2884 Works 2.00B–Five tools needed to run a growing business with varied needs. Word processor, spreadsheet, communications, database, and drawing with page layout $179.

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4470 Fanny Mac QT 55.

★Moustrak ... 60 day MBG

2694 Moustrak Pad *(standard 7" x 9")* . . . 8.
2692 Moustrak Pad *(large 9" x 11")*. 9.
2693 Moustrak Pad L/F *(9" x 11")* 10.

Ribbons

3255 ImageWriter II Ribbon Black 4.
3261 ImageWriter II Ribbon Multi-4-Color . 9.
3270 ImageWriter II Rainbow 6-Pack. . . . 20.
3260 ImageWriter LQ Black Ribbon. 17.

★Sopris Softworks ... 60 day MBG

4171 Mac SE Std. Keyboard Cover *(navy)* . . 15.
4019 Mac SE & Ext. Keyboard Cover *(navy)* . 15.
4017 ImageWriter II Cover *(navy)* 11.
4018 LaserWriter II Series Cover *(navy)* . . 17.
4012 High Trek ImageWriter Carry Case. . . 49.
4013 High Trek Mac Plus Carry Case. 59.
4014 High Trek Mac SE & Ext. Kybd. Case. 69.
5839 Mac IIcx CPU & Kybd. Carry Case . 69.
4862 SE Protection Pak *(ext. keyboard)* . . 75.

★Targus ... 60 day MBG

3618 ImageWriter II Carry Case. 45.
3617 Mac Plus/SE Carry Case. 55.



CompuServe ... 60 day MBG

1673 Navigator 3.0–Saves you time & money by totally automating your on-line tasks. It logs on, takes care of forum business & pending electronic mail & logs off. It can even run unattended or in the background $49.

4015 Mac SE & Ext. Kybd. Carry Case . . 69.
6116 Mac IIcx Carry Case 75.

★Tripp Lite ... 30 day MBG

6199 Isobar 4 *(surge suppressor, 4 outlets)*. 49.
6200 Isobar 6 *(surge suppressor, 6 outlets)*. 59.

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Continental US: Barring massive computer failures and other natural or unnatural catastrophes, all credit card orders phoned into MacConnection weekdays by 8 PM EST will ship Airborne Express the same night for delivery the next business day, except for those within UPS Ground Zone 1 (which is also an overnight service). Saturday delivery available to many areas upon request. Some areas require an additional day delivery. The total freight charge on any order placed with MacConnection is only $3.

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1608 DataSaver 400W. 429.

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1818 HyperDialer 32.
6901 Switchboard *(modular keyboard)* . 175.
6815 Function Key Module 39.
6813 Modular Trackball 119.

★Forte Communications ... 30 day MBG
7317 Remote Keyboard/Mouse. 289.

★GDT Softworks ... 30 day MBG
6256 PrintLink Collection 3.01 59.
6151 JetLink Express 1.1 89.
6255 Expressive Fonts 119.
6257 JetLink/Expressive Fonts Bundle. . 159.

Hewlett Packard
6514 HP DeskWriter Printer. 859.
6689 HP DeskWriter & ATM Bundle. . . . 889.

★Kensington ... 30 day MBG
2576 Turbo Mouse for Mac Plus 3.0. . . . 109.
2547 Turbo Mouse ADB 3.0. 109.

Koala
2593 MacVision 3.0. 259.

Kodak
6730 DICONIX M150 Plus Printer 489.

★Kraft Systems ... 60 day MBG
4082 3-Button QuickStick ADB 49.
6099 ADB Trackball *(with foot pedal)* 79.

★Logitech ... 30 day MBG
5082 ScanMan Mac Model 32 319.

Magnavox
6693 9CM080 14" Color Monitor. 529.
6690 14" Color Monitor with Micron Xceed for SE/30 *(640 x 480)* *special* 849.
6691 14" Color Monitor with Micron Xceed for Mac II *(640 x 480)* *special* 849.

★Micron ... 30 day MBG
6680 Xceed for SE/30 *(640 x 480)* 349.
6679 Xceed for Mac II *(640 x 480)* 349.
6673 Xceed for SE/30 *(1024 x 768)* 589.
6672 Xceed for Mac II *(1024 x 768)* 589.

★MicroSpeed ... 30 day MBG
6620 MacTRAC. 65.
6621 MacTRAC ADB 75.

★Mobius Technologies ... 60 day MBG
6126 Mobius Cordless Mouse 95.

★Mouse Systems ... 30 day MBG
2808 A+ Mouse 58.
2809 A+ Mouse ADB 75.

★Nutmeg Systems ... 30 day MBG
2994 15" Monitor for Mac SE. $599.
6168 15" Monitor for Mac SE/30 599.
2993 15" Monitor for Mac II 599.
4003 19" Monitor for Mac SE. 995.
7152 19" Monitor for Mac SE/30 995.
4004 19" Monitor for Mac II 995.
6240 30/2 Interface *(SE/30 video board)* 499.
4849 LCD Interface 399.

Olduvai Software
5138 Read-It! OCR Personal 2.1 124.
3034 Read-It! OCR 2.1 245.

★Orange Micro ... 30 day MBG
3036 Grappler *(9 pin)* 78.
6229 Grappler LX 129.

SAFE Power Systems
4561 SAFE 250 Watt Backup. 199.
6747 SAFE 400S Watt Backup. 409.

TheComplete PC
6104 Half-Page Scanner/400 309.
6103 Full-Page Scanner 759.

Thunderware
3648 ThunderScan Plus ThunderWorks. 199.
4994 LightningScan 400 385.

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1107 *Low profile 80 nanosecond SIMMs* . 79.

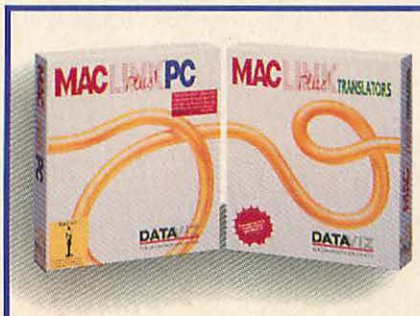
Apple Computer
6707 Mac Portable 1 Meg. Exp. Kit 549.

CD Technology
6983 CD-ROM Porta Drive 649.

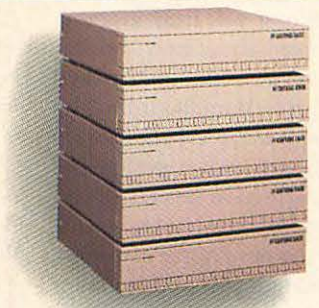
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3989 800K External Disk Drive 149.
5133 20+ Meg Hard Drive 339.
3990 30+ Meg Hard Drive 379.
3991 45+ Meg Hard Drive 435.
5275 60+ Meg Hard Drive 469.
5276 80+ Meg Hard Drive 529.
5456 45 Meg Removable Drive 699.
5736 45 Meg Removable Cartridge. 89.

★Dove Computer ... 60 day MBG
1802 Dove Tool Kit 15.
1801 SCSI Interface/Port 109.
6727 MaraThon Serial/Parallel 189.
6726 MaraThon MultiComm 319.
6725 MaraThon 030 for Mac II. 449.
6724 MaraThon 030 for SE $449.
6723 MaraThon 030 for Plus 449.
7305 MaraThon 030 for Mac IIx. 449.
1807 MacSnap 524E. 185.
1809 MacSnap 524S. 239.
1811 MacSnap 548E 419.
1812 MacSnap 548S. 479.
6973 MacSnap 2S. 179.
6975 MacSnap 4S. 349.
5623 MaraThon Racer. 149.

★Kennect Tech. ... 30 day MBG
5631 Rapport 195.
5632 Drive 2.4 *(includes FastBack II)* . . . 325.



DataViz ... 60 day MBG
1823 *MacLink Plus/PC 4.5*–Transfer and translate files, in either direction, between the Macintosh and DOS, NeXT, OS/2, and Sun formats. Includes over 100 translators. . **$119.**
4842 *MacLink Plus/Translators 4.5* 99.



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★Micron ... 30 day MBG
7149 Xceed IIci-128 Cache Card 589.

NEC
7352 Battery Pack for CDR35 59.
6744 CDR35 CD-ROM Portable Drive . . 399.
6743 Mac Driver Kit. 64.

★SuperMac Tech. ... 30 day MBG
5447 Dataframe XP 30 Hard Drive. 599.
5448 Dataframe XP 60 Hard Drive. 799.
5449 Dataframe XP 100 Hard Drive . . . 1049.
5450 Dataframe XP 150 Hard Drive . . . 1399.
5451 Dataframe XP 330 Hard Drive. . . 2369.

Toshiba
6749 XM 3201 CD-ROM Drive. 899.

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★Sony ... 60 day MBG
3297 3½" DS/DD Disks *(10)* 13.
6148 3½" DS/DD Disks 3 Pak *(30)* 30.
3298 3½" HD Disks 1.44 Meg *(10)* 22.
6375 3½" HD Disks 3 Pak *(30)* 56.
6659 QD2000 40 MB Data Cartridge. . . . 19.

★MAXELL ... 60 day MBG
2792 3½" DS/DD Disks *(10)* 14.
2793 3½" HD Disks 1.44 Meg *(10)* 27.

★3M ... 60 day MBG
3943 DC2000 40 MB Data Cartridge. . . . 20.

★MacConnection ... 60 day MBG
6592 44 Meg. Removable Cartridge 85.

ACCESSORIES

Apple Computer
1113 Black ImageWriter Ribbon 10.

tion, many people may prefer the IIci's compact size and lower purchase and memory-upgrade prices. For these reasons the IIci may be the performance leader for the rest of us.

Michael D. Zuteck
Kemah, Texas

Apple Uber Alles

After so many years of hearing that American manufacturing is lousy, uncompetitive, and unprofitable, it was truly inspiring to read about how the Mac is made ["Behind Locked Doors: Manufacturing the Mac," May, 1990]. Despite the well-known design and construction defects of certain Macintosh components in the past, Apple remains a shining beacon of hope for American manufacturing, both in the quality of its design and in the obvious care and precision with which its products are assembled. If other American manufacturers would adopt such widespread automation and insist on such quality, American manufacturing could rebound, particularly in consumer electronics. If Apple can profitably produce such incredibly complex computers and peripherals in America, why can't it set up a few more assembly lines and make relatively low-tech consumer electronic goods? I'd be the first to place an order for an Apple television, stereo receiver, or VCR.

Thomas Seibold
Berrien Springs, Michigan

Dictionary Deluge

I now have seven different dictionaries associated with the following applications: Microsoft Word, Microsoft PowerPoint, More II, Canvas, MacProof, Vantage, and Cricket Presents. Between them, these dictionaries occupy over 1.4MB on my hard drive.

I need both the Microsoft Word dictionary and the Microsoft PowerPoint dictionary because Microsoft's medical and legal dictionaries cannot be merged. Both contain base words plus specialized parlance. MacProof has three different spelling files. The upgrades to FileMaker and PageMaker will be out and, yes, they too will have their own dictionaries. All this and I still don't have the science and engineering dictionary I really want.

It's time for the industry to develop some kind of standard so that at least the word entries can be merged together, perhaps even manually. Or better yet, maybe some enterprising company or shareware programmer could do us all a favor and write an application that can do it for us.

Alan Ullman
via CompuServe

Plastic Persecution

The letter from Elliot Einzig Porter [*Letters,* April 1990] is evidence of the inaccuracies that abound in the fashionable plastic-bashing community.

Plastic packaging is not cheap. To use an "excessive" amount in the design of a package would hit the manufacturer where it hurts the most: the wallet. Software packaging is there for a reason. It protects floppy disks from damage and lends to

(continues)



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the integrity of the whole package. Replacing the plastic with a paper structure capable of doing the same job would require a package of approximately two times the weight and four times the bulk of the plastic.

Plastic is not difficult to recycle. The next time Porter tosses his software's plastic package, I suggest he toss it into a recycling bin, available in many communities around the country, and I suspect, even in Berkeley. It takes very little energy to reprocess plastic waste into a new article; it's easier to recycle than paper, aluminum, glass, or steel.

Most of the solid waste that isn't recycled ends up in landfills. Plastics make up about 8 percent of the waste in landfills, while paper products account for over 40 percent. Plastics are pretty much inert in landfills, while paper and other wastes produce acids, heavy metals, and other toxins that can leach into ponds and streams. This is what kills marine creatures en masse, as opposed to the death of an occasional idiot fish that eats plastic.

Donald W. Hayward
Florence, South Carolina

.

Letters should be mailed to *Letters, Macworld,* 501 Second St., San Francisco, CA 94107, or sent electronically to CompuServe (70370,702) or MCI Mail (294-8078). Include a return address. We regret that, due to the high volume of mail received, we're unable to respond personally to each letter. We reserve the right to edit all letters. All published letters become the property of *Macworld.*



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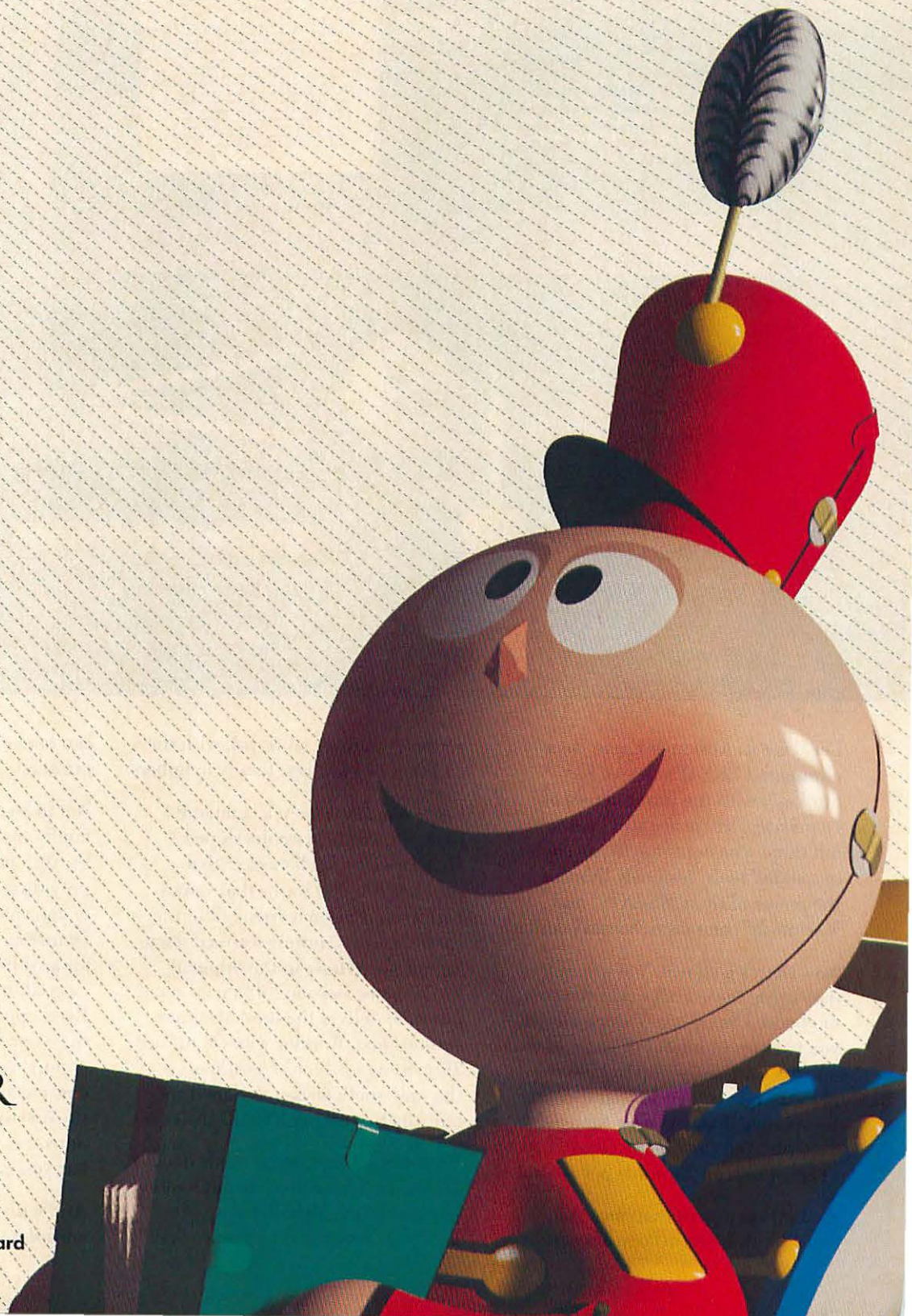
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If You Use These...



Let's face it. Although Caere® nearly eliminated EKS (Excessive Key Strokes°) with the introduction of *OmniPage*,™ there are still businesses out there who continue to use slightly *outmoded tools*, seriously limiting the power of their MS-DOS® and Macintosh® computers. Sound familiar?

Now there's a choice. You can enter data using these artifacts of the past, or choose *OmniPage*—which allows you to enter hundreds of pages of data quickly and easily—up to 1500 words per minute. And all for significantly less money than you ever thought possible. You can *choose OmniPage*, or learn to type 25 words per second.

And if that doesn't convince you, consider this: *OmniPage* has just gotten even more powerful, with the addition of a few new family members.

Caere has never been a company to mince words so we developed *OmniSpell*,™ a spellchecker that contains 100,000 words that works with *OmniPage* to correct all of the spelling errors in your scanned documents, even those in the original work—going beyond 100% page recognition to deliver the most accurate scanned text. Working with *OmniPage's* Transitional Editor,™ *OmniSpell* is the only spellchecker designed specifically to work with OCR°° software.

With *OmniDraft*,™ draft mode documents don't have to come out looking like electronic alphabet soup. At last, page recognition software that can read output from dot matrix printers—in an instant.

Not to be outdone by other prominent family members, *OmniProof*™ makes the differences *perfectly clear*, by providing side-by-side comparisons of your most critical documents. *OmniProof* works exceptionally well for anyone developing lengthy desktop published documents or manuals. Even opposing attorneys will have little opposition to the way that *OmniProof* allows them to review legal contracts and documents. *OmniProof*, the one tool to insure the best final outcome, no matter what side of the bar you happen to be on!

And with our most recent family addition, *OmniTrace*,™ you can now

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recognize pictures and images the way *OmniPage* lets you scan words—flawlessly. Especially useful for graphic designers, architects and those in business who are concerned with *image*, you can bring any picture into focus. Even complex business forms. Scan black and white images and instantly convert them to PostScript® format for high-res output. Use *OmniTrace's* sophisticated editing tools to refine any shape, curve or line. It's the one software tool from Caere that allows you to put your best image forward.

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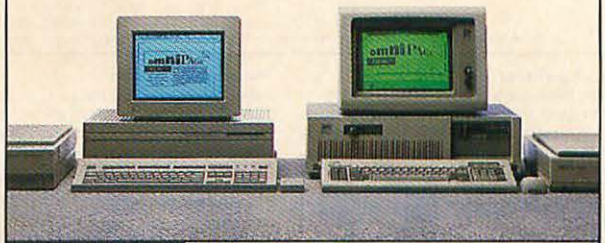
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Or Write:
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Los Gatos, CA 95030

*Excessive Key Strokes (EKS) has been known to cause knee quivers and thumb spasms in data entry personnel, engineers and graphic designers who work with computers.

**OCR is an abbreviation used by industry experts for *optical character recognition*, an important component of page *recognition*.

omniPAGE™



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This Ad isn't Big Enough!

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ALBERTUS BOLD TITLING
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Allegro

Amelia

America
America ITALIC
America BOLD

American TYPEWRITER LIGHT
American TYPEWRITER MEDIUM
American TYPEWRITER BOLD
American TYPE OUTLINE

American UNCIAL & INITIALS
American UNCIAL & INIT. BOLD
American UNCIAL & INIT. OPEN

Andrich MINERVA
Andrich MINERVA ITALIC

Antikva MARGARET
Antikva MARGARET ITALIC

Aquarius 2
Aquarius 6
Aquarius 10
Aquarius OUTLINE

Arquitectura

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AUGUSTEA
AUGUSTEA INLINE

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Avant Garde GOTHIC LIGHT OBL
Avant Garde GOTHIC BOOK
Avant Garde GOTHIC OBLIQUE

Garde GOTHIC DEMI
Gyde GOTHIC OBLIQUE

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LIGHT ITALIC W/SWASH
DEMI W/SWASH
DEMI ITALIC W/SWASH
BOLD W/SWASH
BOLD ITALIC W/SWASH

Bookman OUTLINE W/SWASH
Bookman CONTOUR W/SWASH

PLATE

Broadway
Broadway ENGR.

Brody

Brush

BUSORAMA LIGHT
BUSORAMA MEDIUM
BUSORAMA BOLD

C Modern

CARTOON BOLD

Casino
Casino GREY

Caslon Antique
Caslon Antique ITALIC

Caslon NO. 224 BOOK
Caslon NO. 224 BOOK ITALIC
Caslon NO. 224 BOLD
Caslon NO. 224 BOLD ITAL

Castle
Castle GREY

Century BOOK
Century BOOK ITALIC
Century BOLD
Century BOLD ITALIC

Corvinus Skyline

Cushing BOOK
Cushing BOOK ITALIC
Cushing BOLD
Cushing BOLD ITALIC

Daily Tribune

BAVIBA BOLD

Delphin No. 1

Didi

Egyptian
Egyptian 505 OUTLINE

Elan BOOK
Élan BOOK ITALIC
Élan BOLD
Élan BOLD ITALIC
Élan BLACK
Élan BLACK ITALIC

ELEKTRIK

Eras LIGHT
Eras BOOK
Eras MEDIUM
Eras DEMI
Eras BOLD
Eras ULTRA
Eras OUTLINE
Eras CONTOUR

Esprit BOOK
Esprit BOOK ITALIC
Esprit BOLD
Esprit BOLD ITALIC

Estro

Eurostil
Eurostil BOLD

Gamma BOLD
Gamma BOLD ITALIC

Garamond BOLD
Garamond BOLD ITALIC
Garamond BOLD COND. ITALIC

Gill Sans LIGHT
Gill Sans LIGHT ITALIC
Gill Sans
Gill Sans ITALIC
Gill Sans BOLD
Gill Sans BOLD ITALIC
Gill Sans ULTRA BOLD

Gillies Gothic LIGHT
Gillies Gothic BOLD

Global

GLYPHIC SERIES
GLYPHIC SERIES ITALIC
GLYPHIC SERIES OUTLINE
GLYPHIC SERIES OUTLINE ITALIC

GOLDRUSH

Gorilla

Goudy OLD STYLE
Goudy OLD STYLE ITALIC

Jamille

Kabel MEDIUM

Kaufman Script

Korinna BOLD
Korinna KURSIV BOLD
Korinna OUTLINE

Leawood BOOK
Leawood BOOK ITALIC
Leawood BOLD
Leawood BOLD ITALIC

Liberty
Liberty OUTLINE

PLATE

LSC Condensed
LSC Condensed ITALIC

LSC Manhattan

Lubalin GRAPH EXTRA LIGHT
Lubalin GRAPH EXTRA LIGHT OBLIQUE
Lubalin GRAPH BOOK
Lubalin GRAPH BOOK OBLIQUE
Lubalin GRAPH MEDIUM
Lubalin GRAPH MEDIUM OBLIQUE
Lubalin GRAPH DEMI
Lubalin GRAPH DEMI OBLIQUE

Lubalin GRAPH BOLD
Lubalin GRAPH BOLD OBLIQUE

Nelson CASUAL SCRIPT

New Baskerville
New Baskerville
New Baskerville
New Baskerville

New Yorker
New Yorker ENGRAVED

News Gothic
News Gothic BOLD

New Text REGULAR

Novarese BOOK
Novarese BOOK ITALIC
Novarese BOLD
Novarese BOLD ITALIC

Olive ANTIQUE
Olive ANTIQUE ITALIC
Olive ANTIQUE BOLD
Olive ANTIQUE BLACK
Olive ANTIQUE NARROW
Olive ANTIQUE BLACK EXT.
Olive ANTIQUE BLACK EXT. ITALIC

Omni
Omni ITALIC
Omni BOLD
Omni BOLD ITALIC
Omni BLACK

ORCANDA
ORCANDA BOLD

P. T. Barnum

Pacella BOOK
Pacella BOOK ITALIC
Pacella BOLD
Pacella BOLD ITALIC

PAINTBRUSH

PAINTBRUSH GREY

PACIFICA COND.

Signature
Signature light

Slimbach BOOK
Slimbach BOOK ITALIC
Slimbach BOLD
Slimbach BOLD ITALIC

Sol THIN
Sol HEAVY

Souvenir
Souvenir ITALIC
Souvenir DEMI
Souvenir DEMI ITALIC

STAMP
STAMP GREY

STEELPLATE

STENCIL

Sterling

Stone Inf. MEDIUM
Stone Inf. MEDIUM ITALIC
Stone Inf. SEMI BOLD
Stone Inf. SEMI BOLD ITALIC
Stone Inf. BOLD
Stone Inf. BOLD ITALIC

Stone Sans MEDIUM
Stone Sans MEDIUM ITALIC
Stone Sans SEMI BOLD
Stone Sans SEMI BOLD ITALIC
Stone Sans BOLD
Stone Sans BOLD ITALIC

Stone Serif MEDIUM
Stone Serif MEDIUM ITALIC
Stone Serif SEMI BOLD
Stone Serif SEMI BOLD ITALIC
Stone Serif BOLD
Stone Serif BOLD ITAL

L&C Symie HAIRLINE

Surf Style
Surf Style BOLD

Symbol BOOK
Symbol BOOK ITALIC
Symbol BOLD
Symbol BOLD ITALIC

Ultra Condensed Sans
Ultra Condensed Serif

Uniform 45
Uniform 46
Uniform 55
Uniform 56
Uniform 65
Uniform 66
Uniform 75
Uniform 76

Uptight Regular

Usherwood BOOK
Usherwood BOOK ITALIC
Usherwood BOLD
Usherwood BOLD ITALIC

Veljovic BOOK
Veljovic BOOK ITALIC
Veljovic BOLD
Veljovic BOLD ITALIC

Vivaldi

Weidemann BOOK
Weidemann BOOK ITALIC
Weidemann BOLD
Weidemann BOLD ITALIC

Zapf LIGHT
Zapf LIGHT ITALIC
Zapf MEDIUM
Zapf MEDIUM ITALIC
Zapf DEMI
Zapf DEMI ITALIC
Zapf HEAVY
Zapf HEAVY ITALIC

Zapf CHANCERY MEDIUM W/SWASH ALT
Zapf CHANCERY MEDIUM ITALIC W/REGULAR ALT

Zapf Int'l LIGHT
Zapf Int'l LIGHT ITALIC
Zapf Int'l MEDIUM
Zapf Int'l MEDIUM ITALIC
Zapf Int'l DEMI
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ART BEAT

by Cathy Abes

The tools and the talent behind Macworld's graphics and the techniques that make them possible

Artist: For the opening illustration of our feature on 68030-based accelerator boards (page 134), veteran *Macworld* illustrator John Hersey first used a gray-scale program and then an object-oriented program to create special effects with scanned images.

Hardware: A Macintosh II with a 13-inch AppleColor High-Resolution RGB Monitor, 5MB of RAM, a 40MB internal hard drive, and a Howtek scanner.

Software: Aldus FreeHand and Enhance.

How It Was Done: Hersey first scanned the images of the man, the woman, and the computer chips into the gray-scale program Enhance. Then he created a collage of the chip images and scanned that collage to create a jumbled effect and to obtain what he calls natural textures, as opposed to computer-generated patterns.

Before importing the image of the man into FreeHand, Hersey created a multi-image effect in Enhance to suggest a feeling of speed. First he copied the image with the lasso tool and pasted the copy slightly to the left of the original. Then he used the masking tool to create a transparent effect, making it look like a double image.

He placed the image in FreeHand (saved as a TIFF file) and assigned it a process color. Then after pressing ⌘-I to see its attributes, he adjusted the image's value and brightness and set the print resolution he wanted.

Whenever bitmaps are pasted into FreeHand, they are surrounded by a rectangular bounding box. Since he wanted the images to have a cutout feel (as if he'd

(continues)



The original scanned image Hersey placed in Enhance, a gray-scale program by MicroFrontier.



This is how the image looked after Hersey gave it a double-image effect in Enhance.

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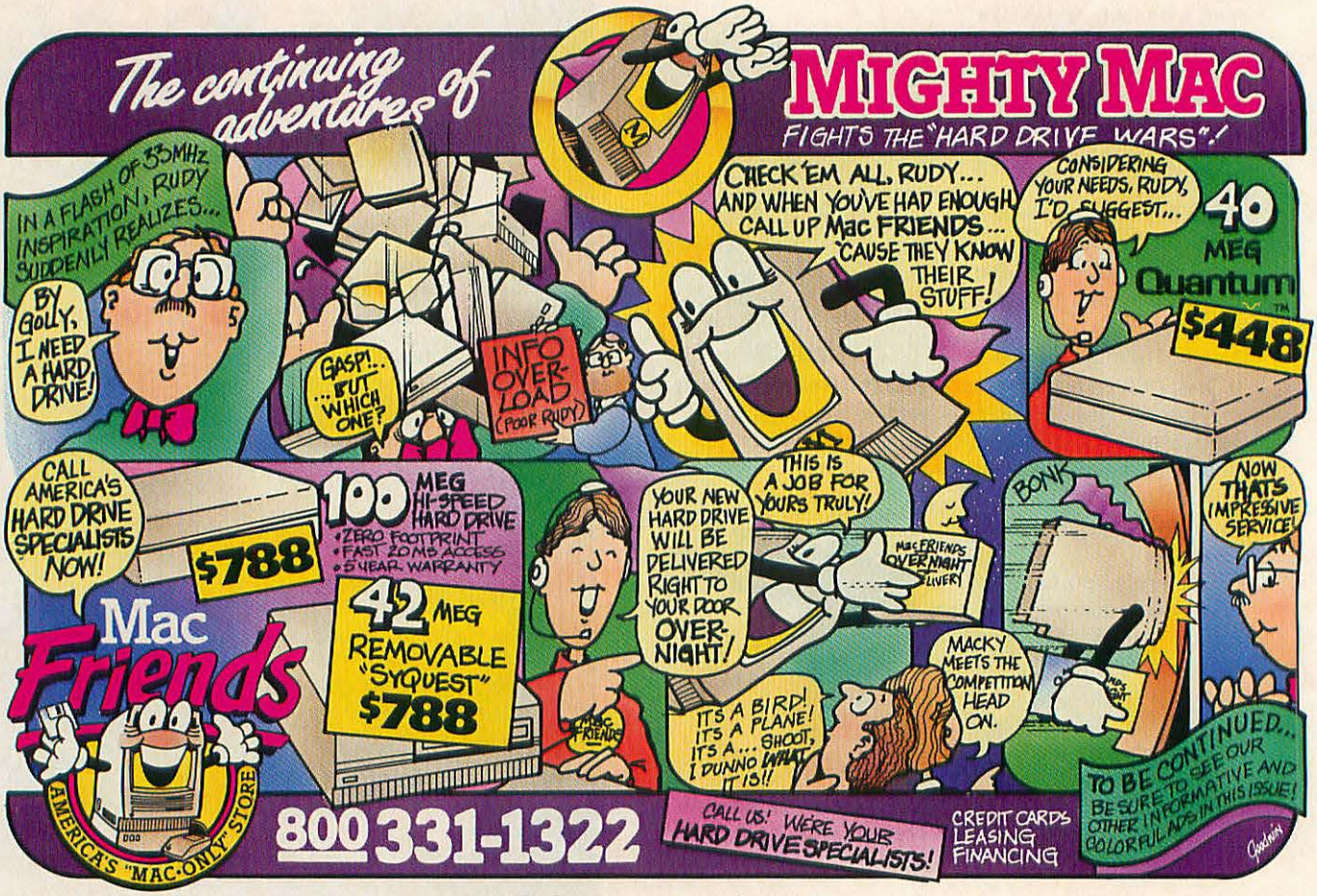


The final color illustration after Hersey used Aldus FreeHand to add silhouette outlines to the bitmapped images and a soft edge to several of the clouds.

clipped them from a magazine), Hersey decided to frame them by creating a silhouette. He placed each image separately in FreeHand, then used the freehand drawing tool to trace a line around the image, making sure it was a closed path. Next, he cut the image to the Clipboard, selected the path he had drawn to frame it, and then pasted the image inside the path, in effect cropping away the bounding box.

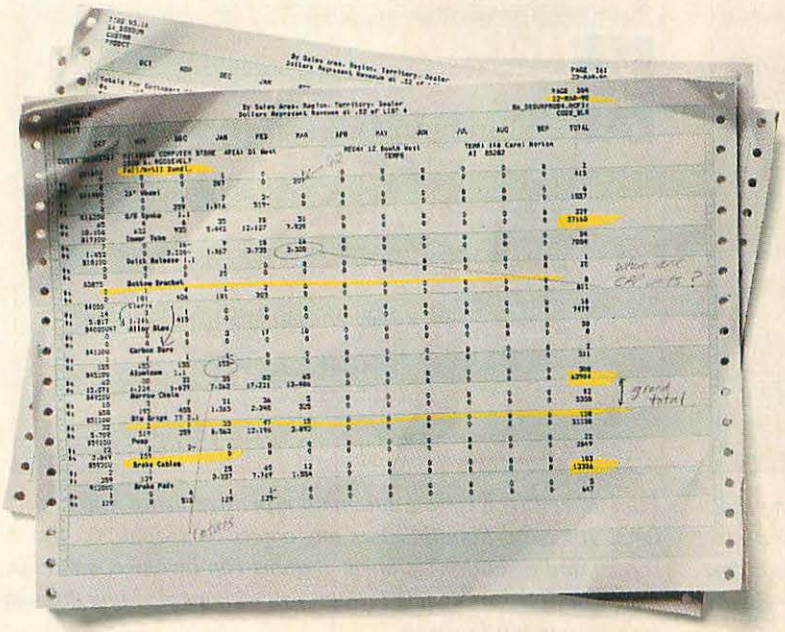
Two of the cloudlike images in the illustration appear to have soft, fuzzy edges. To get this effect, Hersey first created a shape without a line, gave it a color fill of cream yellow, then duplicated—or cloned—it (⌘-=). After positioning the clone where he wanted it, he reduced it from the center point (to even the width of the soft edge). Then, because he wanted the image to blend from cream yellow to white, he filled the cloned smaller shape with white.

After making sure the two shapes were ungrouped, he selected one shape by touching its outline (not an anchor point), then held down the Shift key and selected the other shape. Still holding down the Shift key, he first selected an anchor point on one of the shapes and then the corresponding anchor point on the other shape. Next he selected Blend (from FreeHand's Special menu). Finally, by specifying 50 steps in the resulting dialog box, he actually created 50 new shapes, blending in equal increments from cream yellow to white, to get the soft-edged look he was after. M



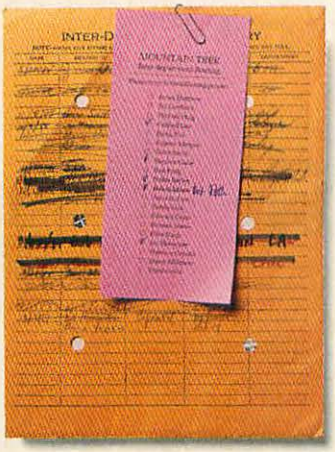
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You can't always choose the data you have to manage.

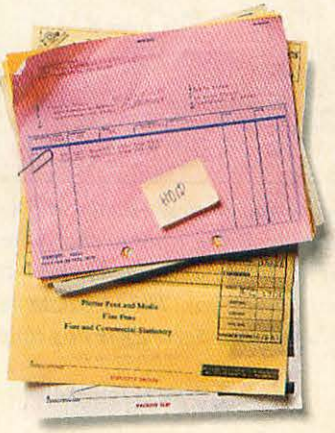


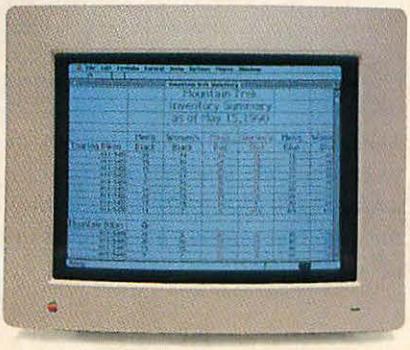




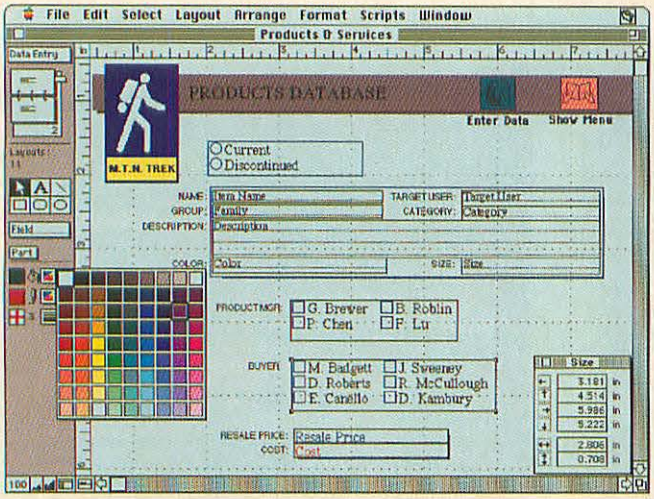








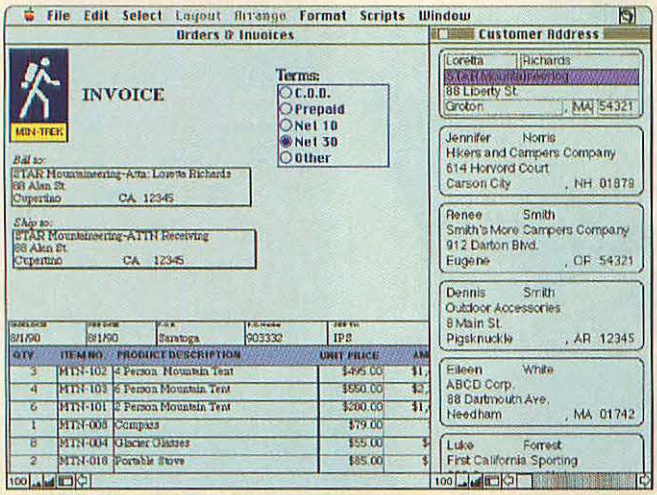
But you can choose how to manage it.



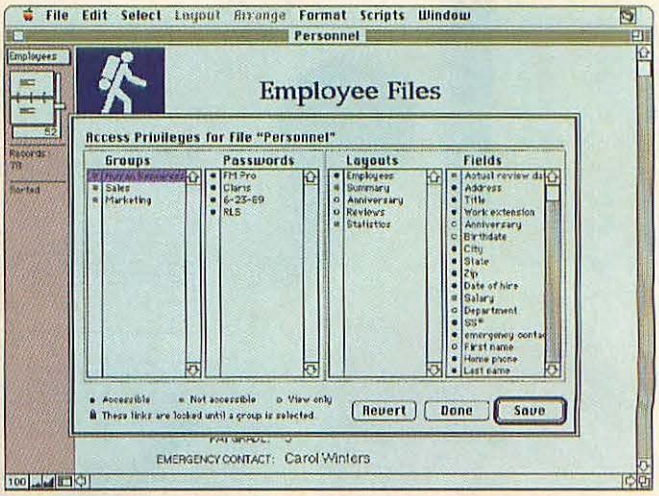
FileMaker® Pro software includes sophisticated drawing tools so you can create layouts in any form you choose. Pop-up menus, radio buttons and checkboxes make entering data fast and accurate. And a full palette of colors helps people vividly see your thoughts.



FileMaker Pro lets you automate repetitive tasks with "buttons." It's easy. Simply select any object or graphic on the screen and a "button" is born. Buttons can invoke commands, trigger scripts, and switch layouts—all without plodding through a programming language.

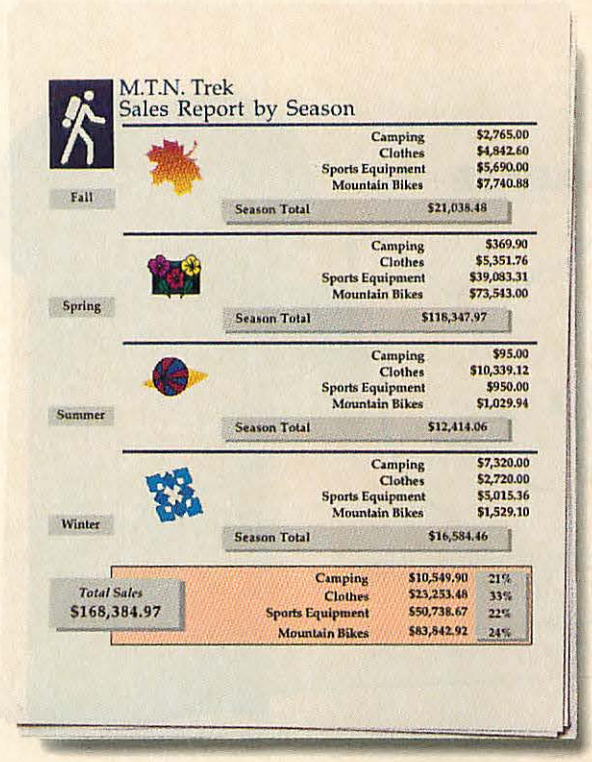


Multiple-file lookups let you relate data. For example, when you want your monthly invoices to each show customer address, FileMaker Pro looks at the customer name, searches the customer address file and fills in each address for you—all automatically.



You can share files on a network and control exactly who sees what on their screen. For example, if you want to share the hire date of an employee, but not his salary, simply check the appropriate boxes in the access dialog box. The hire date field will be shown. The salary field will not. Security is this simple.

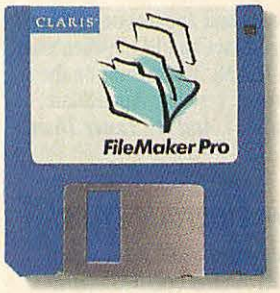
And publish it.



Your job demands information, not data. FileMaker Pro includes a range of calculation functions: It turns raw data into business information. And with MacDraw®-based tools built in, you can display this information on the page any way you want.



All that data you've got stored can be published in eye-catching color, and in any format you can imagine. You can publish directories, forms and catalogs with precision and ease. It's almost like having a database publisher built in.



If collecting data were all it took to get promoted, we'd all be president.

Unfortunately, the world demands you actually do something with your data. And then present it in a compelling and useful way.

Which is where FileMaker Pro comes in. It's the #1 database manager for the Macintosh, stuffed with new power.

There's powerful scripting with user-definable buttons for automating tasks. Multiple-file lookups for relating data. Network access with field-by-field security for workgroups. And flexible report generation, including color and database publishing tools.

Yet, FileMaker Pro does all this without making you learn a complex programming language.

If it sounds simple, it is.

You'll find a few surprises, however. All of them pleasant.

As you use FileMaker Pro you will find more and more things to do with it. This "revealed power" is what makes FileMaker users FileMaker fanatics.

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But why not see for yourself? Simply stop by an authorized Claris dealer and ask to see FileMaker Pro. It's the start of a better way to manage the data you have to manage.

FileMaker Pro.
The #1 database manager for the Macintosh.

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After all, when it comes to the Macintosh, *Nothing Runs Like a Fox!*

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Sex, Lies, and CD ROM

VIRTUAL VALERIE PROVIDES MORE SNOOZE THAN SPARKS

BY STEVEN LEVY

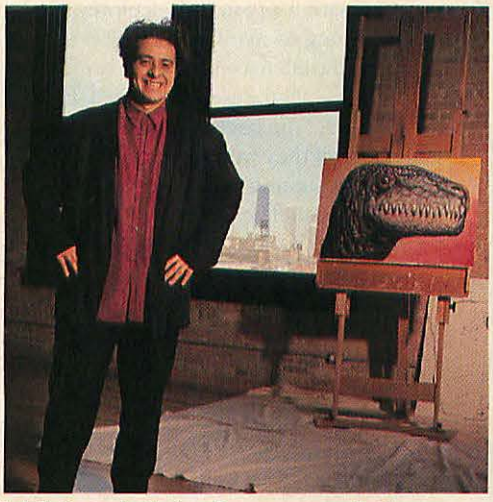
Mike Saenz is an artist whose canvas is a Macintosh screen. He has created some classic graphic projects with the Mac, ranging from *Shatter*, the first comic book created entirely on a computer, to ComicWorks, a pioneering desktop publishing program. He is the president of a new company, Reactor, which promises similar innovations. But Reactor's initial offering recalls another side of Saenz, one that makes him a little more difficult to discuss in a wholesome, upstanding magazine like *Macworld*.

The product is a CD ROM based interactive graphic adventure, and its name is Virtual Valerie. Here's a sampling of the prose from the promotional flyer, which bears the caveat "censored for public exposure."

"LOOK 'N' FEEL! Intuitive interaction and exploration makes Virtual Valerie VIRTUALLY YOURS to play with! And YOU control the action! . . . It's a multimedia sextravaganza!"

The price? Ninety-five dollars, plus a fin for handling, adding up to a cool hundred bucks.

Could it be that multimedia has finally found its proper niche? Is Saenz simply slumming as a pornographer? Is this some sort of cruel sexist joke? Inquiring columnists want to know! So in the service of you, the reader, I procured a CD ROM drive and vowed to explore all the corners of Virtual Valerie, even if it degraded me utterly. What I found was . . . a big come-on.



GWENDOLEN CATES

Is Mike Saenz simply slumming as a pornographer?

The title character is less a virtual woman than a virtual inflatable doll. Playing Virtual Valerie is as sexy as, well, using a computer.

Val Play

Not that sex doesn't figure in the plot, if you want to call it that, of Virtual Valerie. The idea is that you have a date with this doll called Valerie, with all sorts of promises implied, but the first thing you have to do is find the wench. The program is fairly intuitive; you use the mouse to point to the direction you wish to go. So I prepared for a sort of Carmen Sandiego search with witty twists. The first few screens were promising, as the display yielded some stunning images of a New York City apartment house. This is one good-looking adventure game—Saenz is an artist, remember?—and in true adventure-game fashion, I found myself in an elevator, faced with the choice of which of five floors to visit. Imagine my surprise when I went to the first floor, knocked on the door, and came across some beery lout whose digitized voice told me that Valerie lived on the third floor. Could it be that easy?

Yes. Unlike most computer adventure games, solving this puzzle is about as difficult as tying a shoelace; an actual CD ROM player and the proper cables are about a thousand times harder to get than good old Valerie. Our heroine is a neatly rendered, yet ultimately bland model-type seemingly lifted from the pages of a science-fiction poster.

Once I got to the third floor, she invited me in, ushered me to the couch, and immediately got down to business. This was the first of two encounters to which Valerie treats you, and I am sad to report that neither

(continues)



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one is much fun. I don't want to get explicit about this (in fact, if you are under 21 this whole subject matter is something that should not be even imagined before thorough consultation with Ed Meese), but digitized sex with Virtual Valerie seems like a *Penthouse* letter from Hell. Intended to be erotic, the mechanical nature of the interaction with a representation of the nude Valerie—you get to take her clothes off with a mouse (and kids, don't try this at home)—turns out to be a turn-off.

Ironically, the really interesting parts of this so-called sextravaganza have nothing to do with sex. It is only when you conscientiously avoid Valerie and her canned groans and explore the little detours that Mike Saenz has planted within the program that you find the goodies. Interspersed throughout Valerie are the equivalent of MTV video clips that are coming attractions for more-redeeming future products. There are thrilling Frank Frazetta–style scenarios of cyberpunkish technology, and there's eerie animation of smooth sculpted heads bopping to synthesizer rock. Saenz's graphic talents with Mac drawing tools surpass anything else I've seen. If nothing else, the backwaters of Virtual Valerie—if they weren't overwhelmed by the frustrating impotencies of digitized sex—would be terrific evidence for the potential of CD ROM interactive movie-lets.

So why is Mike Saenz doing this? With skin mags and X-rated videos so widely available, can there really be that much of a market for Macintosh porn?

Software without Guilt

Virtual Valerie is not the first of its genre, but thankfully, a short history will cover the subject quite adequately. Most efforts in this realm have been shrouded under the no-fault artifice of the tongue-in-cheek. Practitioners murmur, in essence, "All these pictures of naked women and/or gross sexual matter aren't bad taste—it's a parody of the bad taste of that *other* type of stuff." Perhaps the most successful Macintosh sex program has been a misadventure game titled Leisure Suit Larry in the Land of the Lounge Lizards. The publisher, Sierra On-Line, applies genial wit to an otherwise offensive and misogynistic quest for a bedmate, thereby managing a retreat from the realm of X, to the cozier region of a very soft R, maybe even a PG-13.

But there were also more hardcore efforts. Most notorious was MacPlaymate, created by none other than Mike Saenz. Its background is instructive. Saenz says he created it as a gag, something thrown together in a few days, a hack to impress people at a party. He never figured that it would sell thousands of copies, tick off a group of radical feminists, and draw legal action from *Playboy* magazine. But that it did.

The program had been on the market for several months when, during a Macworld Expo in San Francisco, a representative from the local vice squad suggested that the software—which featured images of a naked

Digitized sex with Virtual Valerie seems like a Penthouse letter from hell

spread-eagled woman, and considerably worse—might not be suitable for display in an area where impressionable youngsters might happen by. Ultimately, the problem was adjudicated by the decision to turn the screens away from the aisles; only those potential customers who were old enough to drink and see computer images of lust and squalor were invited to view the software. Publicity from this nonevent traveled far and wide, and soon MacPlaymate was a hot seller.

Eventually, MacPlaymate ran into trouble on two fronts. First of all, the folks at *Playboy* weren't overly happy with the program's name, which seemed to imply an association with the girls-next-door who posed naked in the centerfold of that classy publication. *Playboy* lawyers play rough, and eventually MacPlaymate went to the great hot tub in the sky, or wher-

(continues)

Put More Into These Computers Than Apple®.



195 Megabytes.

They're today's most powerful personal computers. And to handle really demanding applications, you need to put more into them than 40 or 80 megabytes. Applications like databases. Multimedia. Graphics. Publishing. CAD/CAM/CAE. That's where the MacinStor™ 195i comes in.

The 195i has been *performance matched* to deliver *total Macintosh® power* to every application. With 195 megabytes of capacity. With top performance specs—such as 15ms average seek time and 13 Mbits/sec average data transfer rate. With a clean, 3.5″ drive installation that eliminates power supply and cooling concerns. With comprehensive software utilities that let you easily manage and secure your data. And with 50,000 hours MTBF for long haul reliability.

As with every MacinStor product—internal or external, hard disk or optical, 40 megabytes to a gigabyte—the 195i is a high performance solution no competitor can match. So call up all of the Macintosh power at your fingertips. Call up (408) 879-0300 for MacinStor reseller locations. Or write Storage Dimensions, 2145 Hamilton Avenue, San Jose, CA 95125.

STORAGE DIMENSIONS

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To be called circle 414 on reader service card
For literature circle 127 on reader service card

MacAvenue™

A Division of CompuAdd Corporation

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MacAvenue promised you exciting new products developed by our own engineers. And we delivered! Take a look at the new Protegé hard drives introduced in this catalog. You won't find a better-designed drive on the market.

The Protegé — designed and manufactured by our parent company CompuAdd — is backed by the same engineering strength that has made CompuAdd the Value Leader in personal computer products. CompuAdd Corporation, one of *Inc. Magazine's* fastest growing companies for three years running, designs and manufactures its own namebrand products incorporating the latest technological innovations.

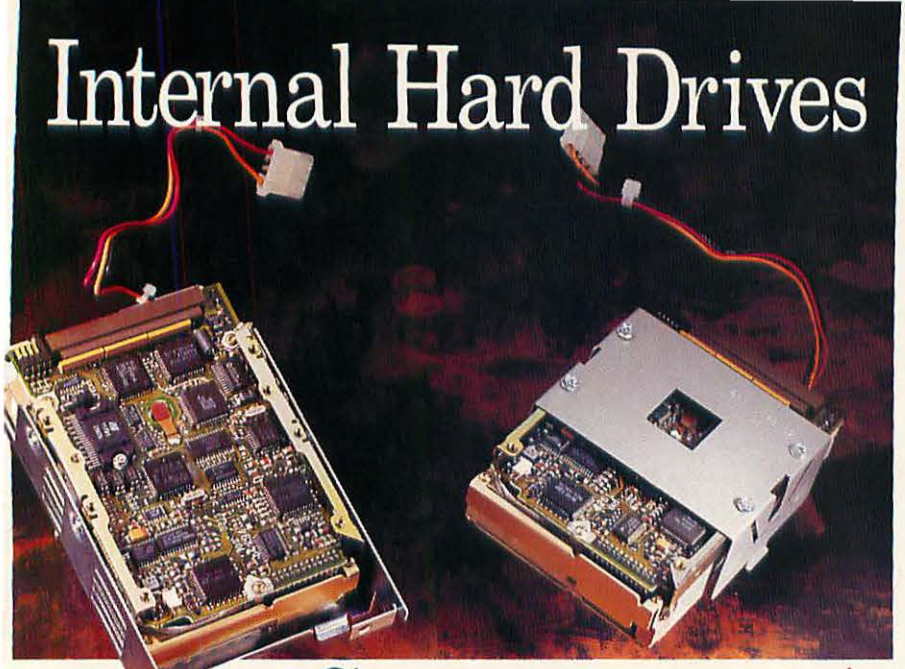
And at MacAvenue we stock the hottest Mac products — value tested hardware and the most popular Mac software. We sift the crop to bring you only the best, the "wheat without the chaff." Our support staff is the friendliest, our satisfaction guarantee is the best, and our prices set the value pace that leaves the competition breathless.

And there's a lot more. $2.00 overnight shipping. A 30-day money-back guarantee and toll-free, expert technical support for all Macintosh products. Full one-year limited warranties on all hardware. Special order capabilities. Volume discounts. Purchase orders, VISA, MasterCard and American Express accepted with no surcharge.

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Storage

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High performance, low profile, and minimum power demands. What more can you ask from a hard drive? With features like automatic error correction, high shock resistance, voice coil actuator, SCSI controller and internal air filtration system, CompuAdd internal hard drive kits sport drive components that perform to the most demanding expectations. All CompuAdd internal drives are ready to run, complete with Apple System and the CompuAdd Disk Management Software that takes care of drive formatting, partitioning, and password protection. A detailed instruction manual and mounting hardware make installation a snap. Throw in some of the best technical support in the business, along with CompuAdd's one-year warranty, and your "driving" satisfaction is insured!

Internal drive kits for SE, SE/30, II, and IIx
20MB Internal HD. *24180* - $295
40MB Internal HD. *24181* - $325
80MB Internal HD. *24182* - $445
100MB Internal HD. *24183* - $575

Internal drive kits for IIcx and IIci
20MB Internal HD. *24184* - $295
40MB Internal HD. *24185* - $325
80MB Internal HD. *24186* - $445
100MB Internal HD. *24187* - $575

CompuAdd Internal Hard Drive Kits

Drive	20	40	80	100
Formatted Capacity	21.4MB	42.65MB	84.3MB	104.9MB
Access Time (ms) Average	27	25	25	25
MTBF (power on hrs.)	20,000	20,000	20,000	20,000
Transfer Rate MB/sec	1.25	1.5	1.25	1.25
Shock Rating Transit	75G	75G	50G	50G
Weight	<1.1 lbs.	<1.1 lbs.	<2.0 lbs.	<2.0 lbs.

Let's Go For A Little Drive
An 800KB drive can be a big help to your Mac system when you want to make disk-to-disk copies or avoid constant disk swapping on a non-hard-drive system. The Fujitsu 800KB drive is just the ticket for this convenience-building enhancement.
Fujitsu 800KB floppy drive. *24731* - $145



24731

You Can Take It With You
With this 44MB Bernoulli hard drive you can give your data both security and portability. Offers nine utilities to manage and safeguard data. And, PageMaker fans, this storage device is endorsed by Aldus.
IOmega Portable 44MB Hard Drive. *24385* - $1850
IOmega Bernoulli Cartridge 20MB, 3 pack. *57805* - $199

A New Kennect-ion
Demand more from your diskettes with the help of the Kennect 2.4 Drive. Stores 2.4MB on a 1.2MB and 1.2MB on an 800KB disk. Reads, writes, and formats to all 3.5" disk standards — Apple and DOS. For Mac SE/30, IIx, IIcx or IIci.
Kennect 2.4 800KB Drive. *24730* - $325

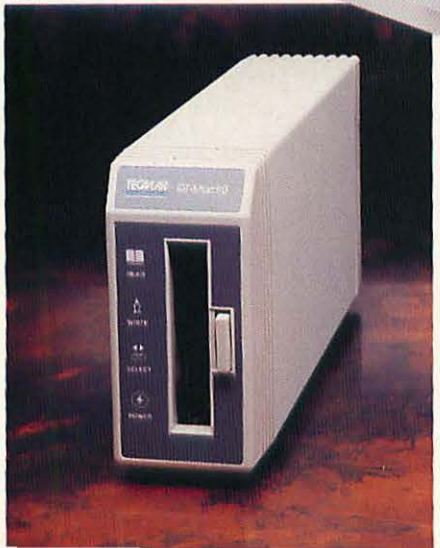
For your Mac 512KE, Plus, SE or II, use the Kennect Rapport Adapter with your 800KB drive to accomplish what the Kennect 2.4 drive does for other models.
Kennect Rapport Adapter. *24930* - $195



24730

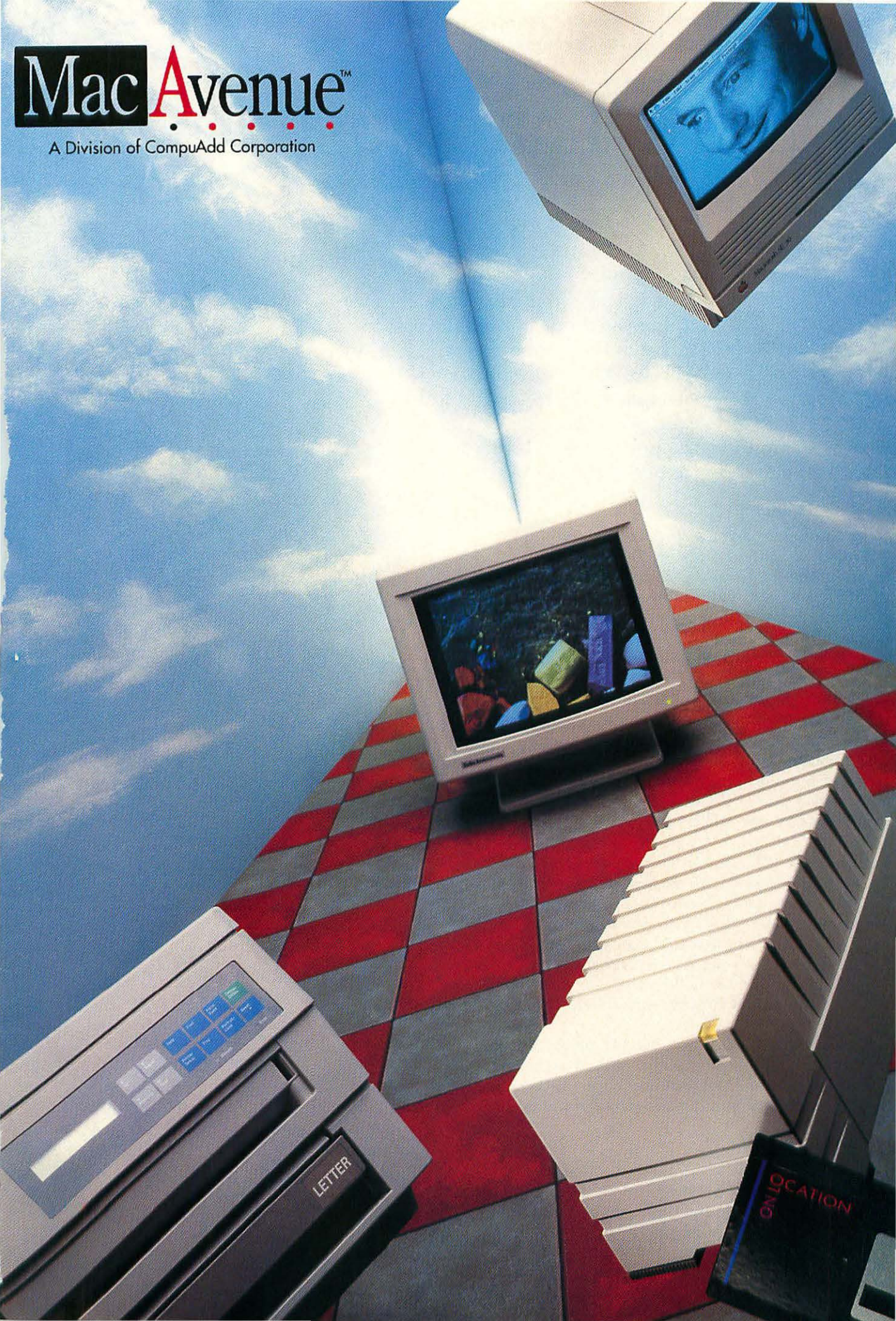
Translation, Please
Sooner or later, even dedicated Macintosh converts will have to read something from DOS. You manage a DaynaFile just like a conventional Mac drive — by dragging, selecting and opening files. Operates transparently through your Macintosh applications. Connect to your Mac through the SCSI port.
DaynaFile 5.25" 1.2MB. *24732* - $550
DaynaFile 5.25" 360KB/1.2MB. *24733* - $725

23831



Quick, Get It On Tape!
Maximum data security is yours with a Tecmar tape backup. Units include icon-interfaced software and are compatible with all Mac hard drives. Tecmar QTs operate in the background under MultiFinder, so you can still use your Mac while you're backing up or restoring.
Tecmar QT Mac 40MB Tape Backup. *23830* - $950
Tecmar QT Mac 80MB Tape Backup. *23831* - $1225

Tecmar QT-40 Cable Kit. *24931* - $106
Tecmar QT Mac Data Cartridge 80MB, 2 pack. *26080* - $85

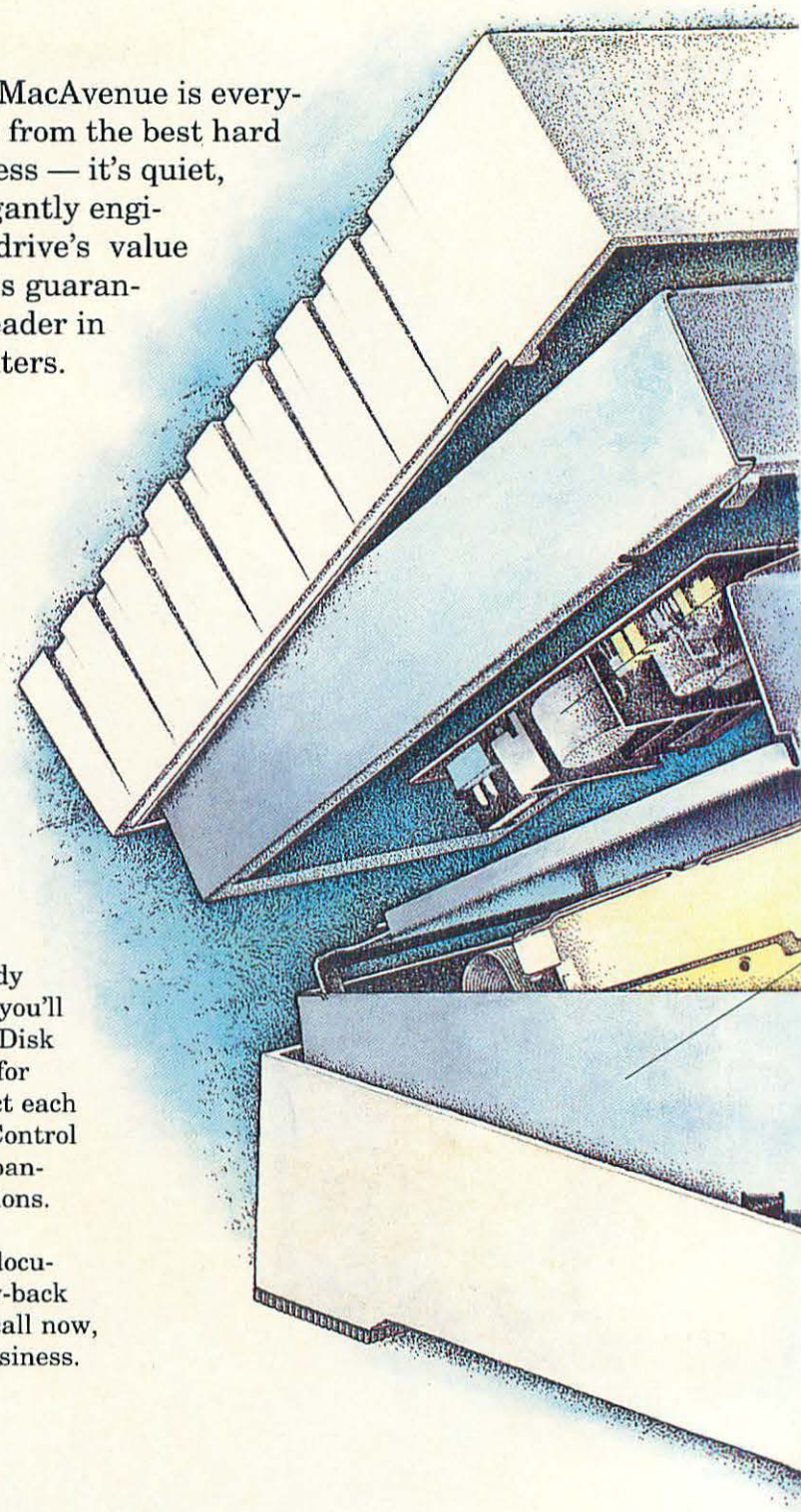

Mac Avenue™
A Division of CompuAdd Corporation
LETTER

Announcing MacAvenue's New Protegé Hard Drive...

More Than Just Another



The Protegé from MacAvenue is everything you'd expect from the best hard drive in the business — it's quiet, cool, fast, and elegantly engineered. And, this drive's value and performance is guaranteed by CompuAdd, the proven value leader in the direct marketing of personal computers.



Here's how our drive will turn you on:
We've manufactured a really cool drive. We mounted the fan to maximize air flow around the drive assembly and past the isolated power supply — efficiently cutting the danger of heat-related failure from the two most important parts of your drive.

The Protegé is not just cool, it's quiet. We've used an interior metal chassis that isolates the drive. So, when you work with the Protegé, all you hear is the sound of one hand clapping. The metal chassis also shields the drive from damage by dangerous electrostatic discharge.

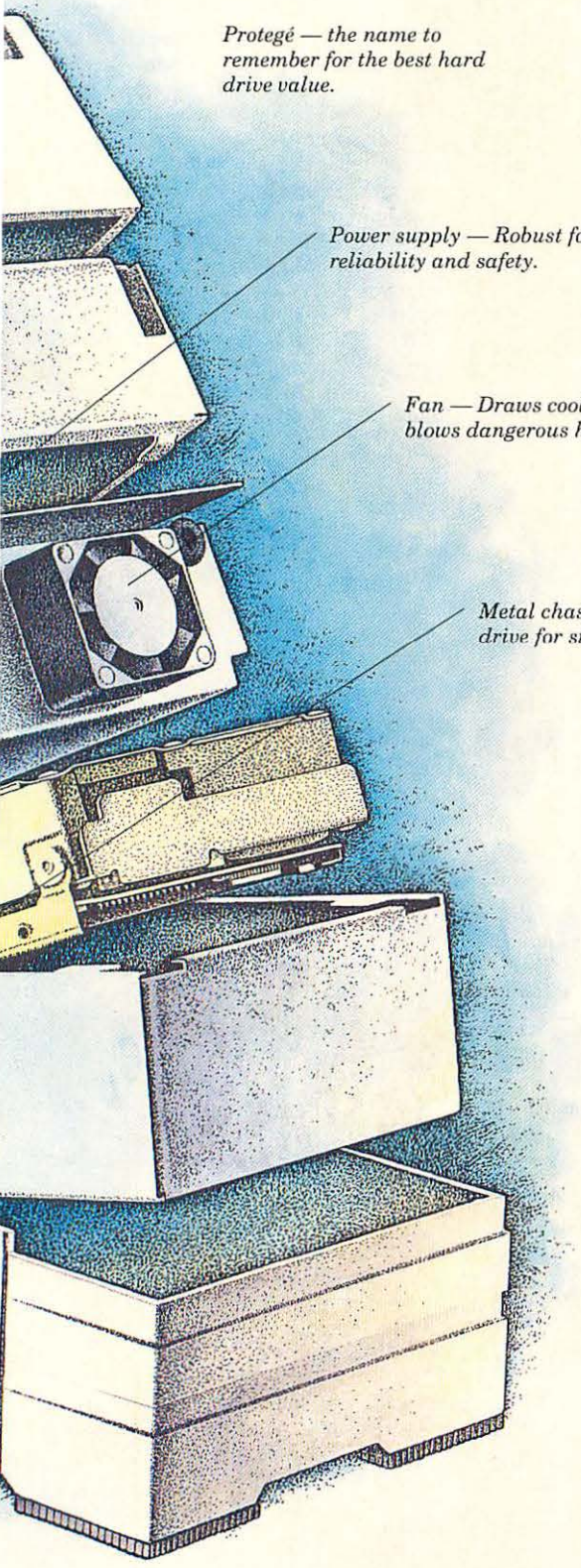
Your Protegé will arrive preformatted and ready for work. As soon as you connect your system you'll find even more useful features. The Protegé's Disk Management Software allows you to partition for more efficient drive operation, password protect each partition, and easily access partitions via the Control Panel. This program will even allow for disk spanning and creation of ProDOS and UNIX partitions.

When your drive is the best, you get superior documentation, a 30-day no-questions-asked money-back guarantee, and toll-free technical support. So call now, and drive a bargain on the best drive in the business.

Call today for more information

800-388-6221

Pretty Case

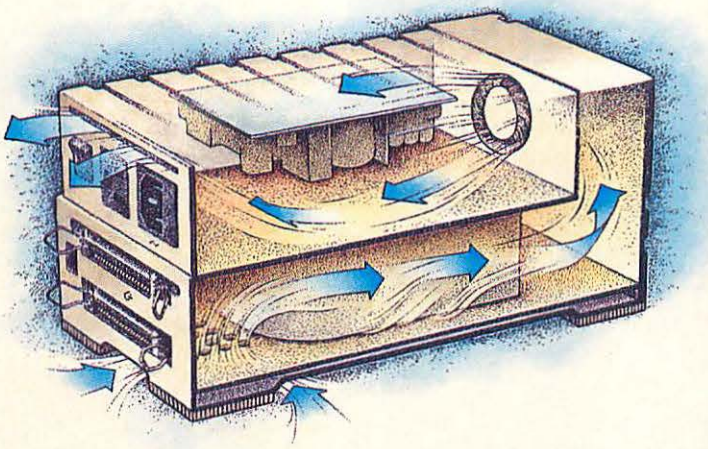


Protegé — the name to remember for the best hard drive value.

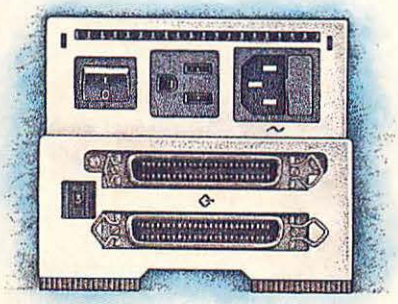
Power supply — Robust for reliability and safety.

Fan — Draws cool air in and blows dangerous heat out.

Metal chassis — isolates the drive for silent operation.



Heat is usually the cause of hard drive failure. We've designed the Protegé hard drive to draw dangerous heat away from the drive assembly and power supply — the two most important components of your hard drive. The fan draws air around the drive itself and then blows the air past the power supply, forcing heat out of the vents and cutting the danger of heat-related failure.



We've added a convenient power outlet so you can easily connect other peripherals to your system without a tangled mess of cables. The external terminator allows you to terminate your drive without dismantling the unit. The push-button SCSI ID selector lets you easily change the drive address. And to further protect your data, the drive's heads automatically park when you shut the system down.

Exclusive!

You'll Never Lose A File

Your MacAvenue Protegé is the only drive on the market to come bundled with On Location, the amazing file-finding utility that will search your entire hard disk and find a lost file in seconds. Just type in a file name or even a few words within the file. On Location does the rest. This utility was created by Mitch Kapor, developer of Lotus 1-2-3. On Location is covered by a one-year warranty. ***A $99 value.***



MacAvenue™

Protegé Hard Drives

Capacity	Seagate	Quantum
20+MB	*24380* - $345	not available
40+MB	*24381* - $395	*24390* - $455
80+MB	*24382* - $525	*24391* - $645
100+MB	*24383* - $649	*24392* - $695

Printers



First Adobe® PostScript® Laser Printer For Under $2500!

A microLaser With MACROapplications
The TI microLaser™ PS is a truly remarkable Macintosh-compatible PostScript printer. Compact, user-friendly, upgradeable *and* affordable, its standard features can be enhanced to print your applications with style. Featuring a complete package of Adobe PostScript *and* HP LaserJet Series II emulations, the microLaser PS prints at 300x300dpi and sports 11 PostScript font families with a total of 35 different fonts — all in a huge array of point sizes. The microLaser fits neatly on your desk because there are no paper tray wings. Its 250-sheet paper drawer conveniently slides into the machine and accepts paper weights from 16 to 34 lbs. For further options, you can easily add a second paper drawer (250-sheet capacity), which fits underneath the printer, or the optional envelope feeder, which hooks onto the manual paper slot and automatically feeds up to 40 envelopes. And upgrading the standard 1.5MB RAM is as easy and economical as adding memory boards — up to 4.5MB RAM total. The microLaser is AppleTalk-ready and compatible with the Centronics® parallel interface.
microLaser PS. *22851* - $2425
Envelope Feeder. *38712* - $299
Second Paper Drawer. *38713*- $325
TI microLaser 1MB RAM upgrade. *38563* - $399



56339

56303

A Family Of Mac Printers

When it comes to impact printers for the Macintosh, the Epson name is synonymous with quality. The Epson LX-810 is a hard-working 9-pin, 80-column, dot-matrix printer that works as well for the business user as it does for the student. With an 11-inch carriage, it prints in draft mode at 180cps and in near letter quality at 30cps. Delivers 240x216 bit-mapped graphics and features three resident fonts.
Epson LX-810. *56303* - $195
Epson LX-810 Ribbon. *37901* - $4

For higher quality dot-matrix output, the 24-pin Epson LQ-510 adds letter quality print and user-defined characters as well as more font choices and typestyles. Automatic cut sheet feeder. Prints 180cps in draft mode and 60cps in letter quality mode. Produces 360x360 bit-mapped graphics.
Epson LQ-510. *56340* - $339
Epson LQ-510 Ribbon. *37915* - $6

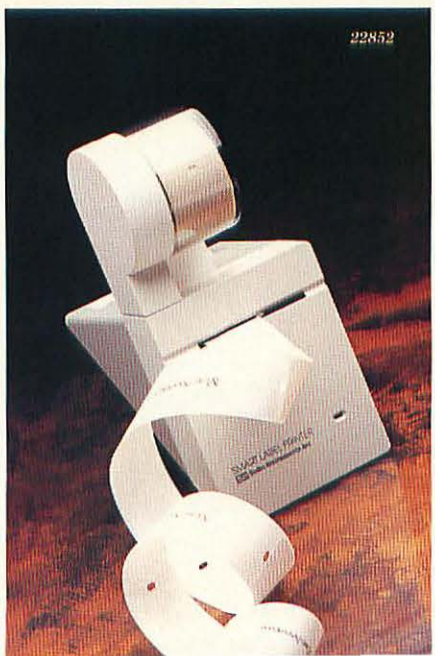
For speed, economy, and impact you can't beat the Epson LQ-2550, Epson's top-of-the-line dot-matrix printer. With a 15-inch carriage, the LQ-2550 provides letter-quality documents at an amazing 133cps. 400cps in draft mode. 360x360 bit-mapped graphics. Eight resident fonts and hundreds of typestyles.
Epson LQ-2550. *56339* - $999
Epson LQ-2550 Ribbon. *37919* - $12

Grappling With Printer Reality

If the question is, "How does my third-party printer connect to my Mac?", the answer is an Orange Micro Grappler. This Grappler connects to Epson, Hewlett-Packard, Toshiba and other 24-pin dot-matrix printers, including the Epson printers listed on this page.
Orange Micro Grappler LX. *22853* - $143
Orange Micro Grappler 9-Pin. *22854* - $91



22853

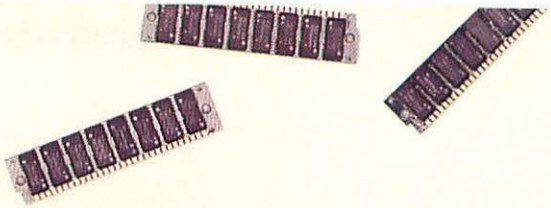


Defies Any Label

Remember the awful '80s when printing labels from your Mac was about the least fun you ever had? Now the new Seiko Label Printer promises us all a brighter future in the '90s. Prints letter-quality labels, bar codes, and large type without interrupting your other computer work. Takes only a small space, operates quietly and independently of other printers.
Seiko Label Printer.
22852 - $195
Seiko Labels. *26902* - $11.99



Boards/Memory

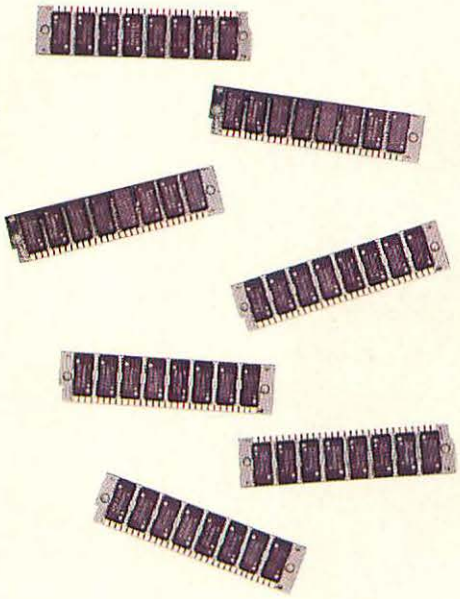


Win The Marathon
Dove's MaraThon 68030 accelerator card doubles the speed of your SE/30, while the 16MHz 020 accelerator makes an SE run faster than a Mac II. Edit detailed graphics and calculate columns in complex spreadsheets or jump from one application to another without waiting for your Mac to catch up.

Dove Marathon 030 SE/30. *23636* - $445
Dove SE 020 with 881 and 1MB.
23637 - $777

Full Speed Ahead
Want to triple graphics and CAD performance on your Mac II? Or maybe you'd like to quadruple speed executions of numerical, CAD and PostScript RIPing operations? Then plug a DayStar PowerCard into your NuBus slot and go to it! The DayStar card is the affordable, no-stress remedy for power-hungry applications that would ordinarily sap your Macintosh. This gem comes with 32KB static RAM cache and the 68882 math chip as standard equipment. And DayStar cards have a long standing record of reliability and high quality.

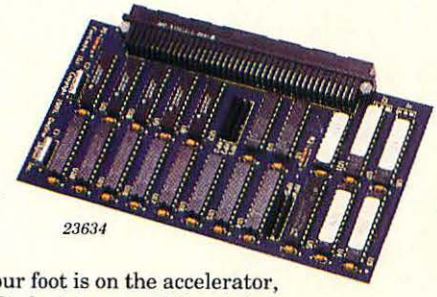
DayStar 030 - 25MHz II *23632* - $1149
DayStar 030 - 33MHz II *23633* - $1539
DayStar 030 - 40MHz II *23638* - $1919
DayStar 030 - 50MHz II *23639* - $2309



Build Your Memory
It seems all the newer and more powerful software programs are memory hogs. You always need more RAM. With 2MB to 4MB you can run at least a couple of applications with MultiFinder. If you really want to get serious, four of the new 4MB SIMMs means you'll have 16MB of RAM power, and that means the sky's the limit. MacAvenue offers only the best 80ns surface-mounted products from Technology Works. And you'll get a step-by-step installation guide and a Torx tool. Beefing up your printer's RAM will speed up the printing process for complicated graphics and heavily formatted reports.

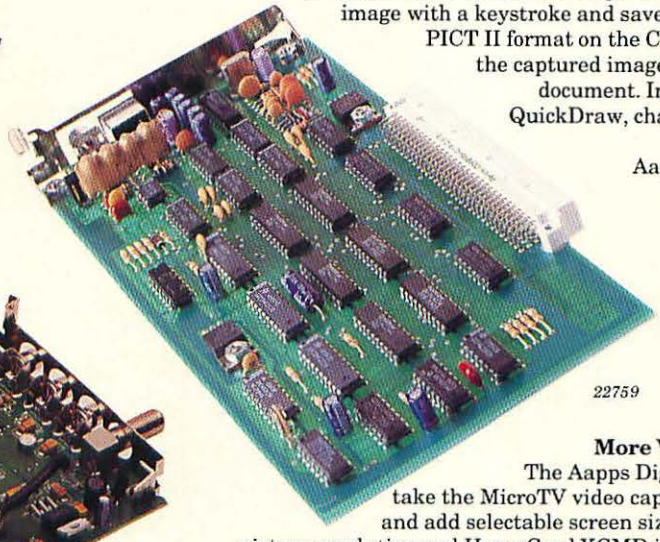
1MB SIMM. *25480* - $Call
4MB SIMM. *25481* - $Call
LaserWriter SIMMs. *25483* - $Call
FX Memory SIMMs. *25484* - $Call

Where'd You Get Those Eyes?
When you need to make a dramatic visual impression, use ComputerEyes to capture 8-bit or 24-bit color images from a video camera or VCR. Digitize the image with a click of the mouse, touch it up in Digital Darkroom, Studio 8, or other paint programs, and save it in PICT2, TIFF, or MacPaint formats. Export the image to PageMaker or Quark for your newsletter.
ComputerEyes (black & white). *22758* - $196
ComputerEyes (color). *22759* - $344



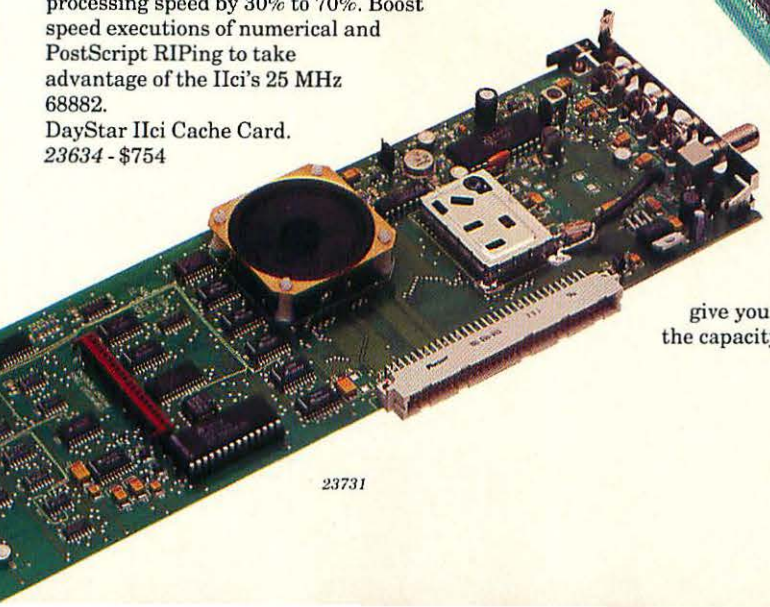
23634

Television In The Computer Age
MicroTV lets you watch television, or any video source through a window on your Mac screen. Operate most programs while video runs. Capture any MicroTV image with a keystroke and save the image in PICT II format on the Clipboard. Use the captured image in any other document. Includes 32-bit QuickDraw, channel control, and tuner.
Aapps MicroTV.
23731 - $275



22759

Now that your foot is on the accelerator, plug a FastCache into your IIci and give your Mac the go-ahead to maximize its processing speed by 30% to 70%. Boost speed executions of numerical and PostScript RIPing to take advantage of the IIci's 25 MHz 68882.
DayStar IIci Cache Card.
23634 - $754



23731

More Video Magic
The Aapps DigiVideo cards take the MicroTV video capture concept and add selectable screen sizes, enhanced picture resolution and HyperCard XCMD integration. If you've already purchased MicroTV, the MicroTV upgrade will give you the additional features offered by DigiVideo B/W. If you want the capacity to capture images in color, choose the DigiVideo Color board.

Aapps MicroTV upgrade. *23734* - $259
Aapps DigiVideo B/W. *23733* - $399
Aapps DigiVideo Color. *23735* - $644

Video

8-bit color for under $1,000!

MacAvenue is an Authorized RasterOps Reseller



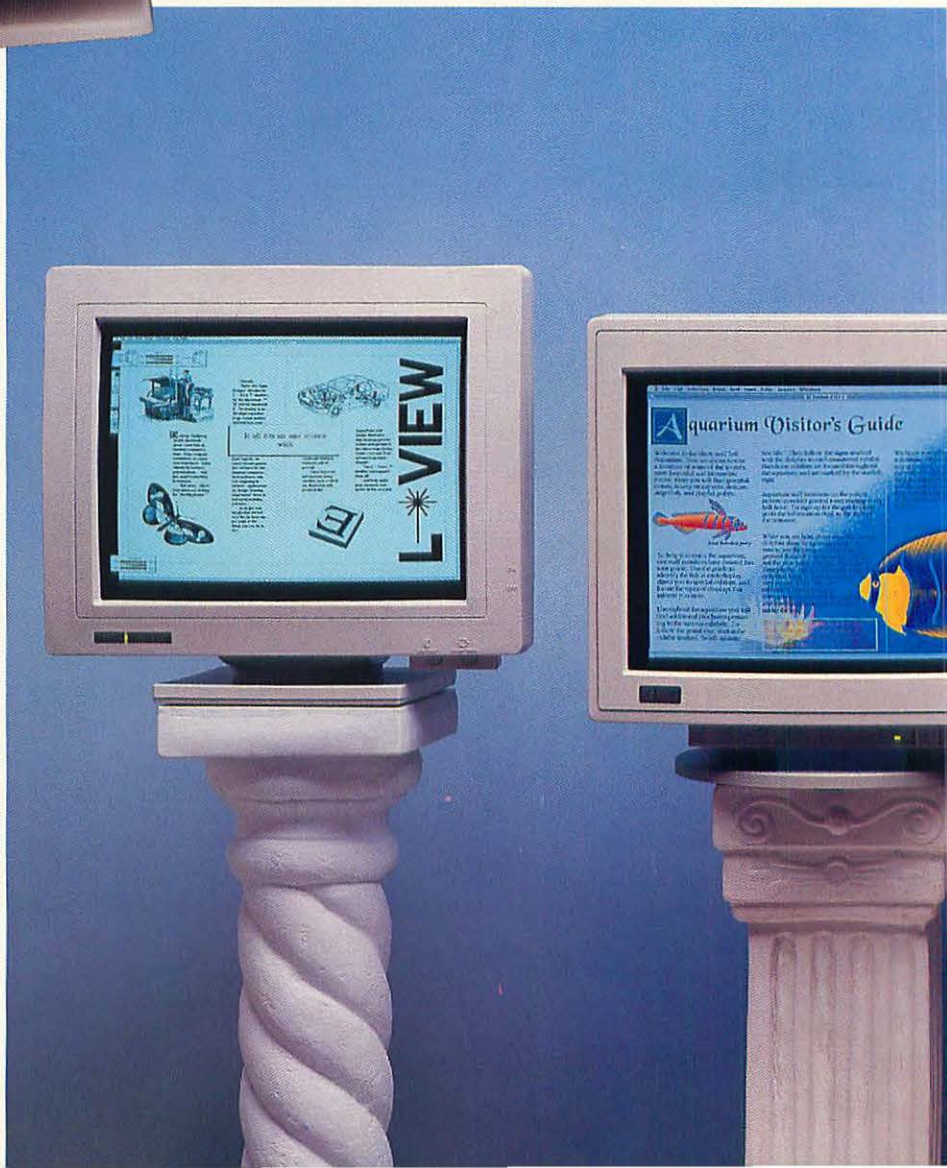
You Gotta Wear Shades
The Seiko 14-inch color monitor and RasterOps Color Board create BRIGHT colors. 43% brighter than the Apple solution. And the picture is sharp all the way to edge of the screen. By combining Sony Trinitron technology and RasterOps 8-bit or 24-bit color technology, the Seiko monitor gives you the best color for the best price!

Complete 8-bit color system.
22005 - $990
Complete 24-bit color system.
22001 - $1190

Seiko 14-inch Color Monitor. *22002* - $595
RasterOps 208 8-bit Color Board.
23538 - $425
RasterOps 264 24-bit Color Board.
23531 - $625

The Mode of the Day
The Sigma L-View Multi-Mode System breaks all records for performance and versatility. This 19-inch, ultra-high-resolution monochrome and gray-scale display system offers six full resolutions in one graphic system. Because the multiple resolutions are built into the L-View hardware, you can choose 120, 92, 72, 60, 46, or 36 DPI with the help of special "hot key" commands. A fast 92 Hz refresh rate gives you a steady, flicker-free monitor image. Features the convenient front panel on/off switch and image controls as well as a tilt/swivel base and paper-white phosphor.
Sigma L-View Multi-Mode System
22008 - $1495

Color To The Max
The Sigma ColorMAX 8/24 Display System brings presentation graphics, illustrations, and design applications to a new level of color display quality on the Mac II. One of the best monitor values on the market, the ColorMAX features a 19-inch Sony Trinitron screen, refreshes 8-bit color at an industry-high 79 Hz, and offers a full 256 screen colors from a palate of 16.7 million colors. Because the 8/24 is user-upgradeable from 8-bit to 24-bit color, you'll save hundreds of dollars in upgrade costs when you make the move to 24-bit color. With precise, 72 dpi true-sized text and graphics, you'll be able to size text and artwork in exact detail.
The Sigma ColorMAX 19-inch Color System. *22000* - $4999

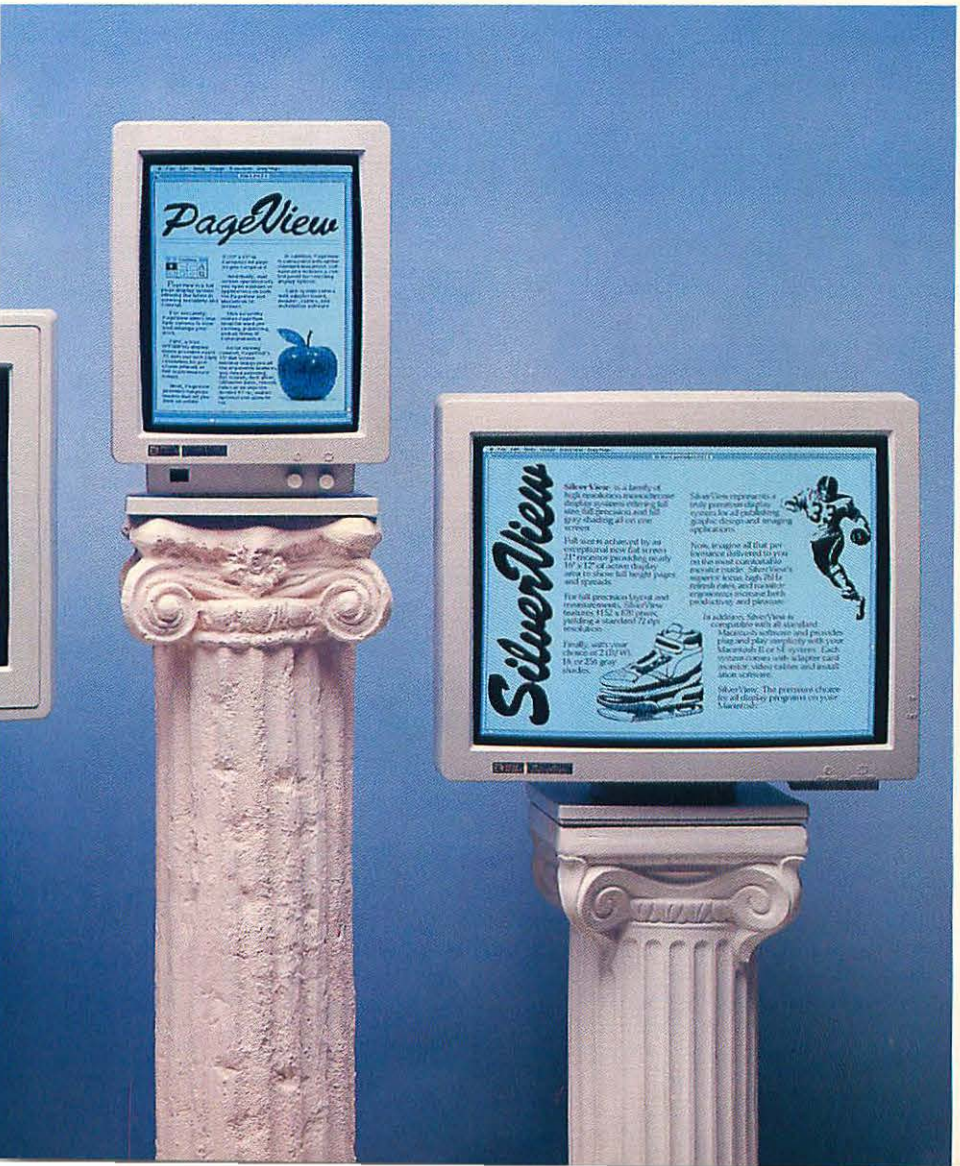


Beyond the Monochrome Horizon
RasterOps ClearVue/GS 19-inch gray-scale monitor takes your Mac II beyond the boundaries of monochrome display by offering 256 shades of gray evenly spaced between black and white. Pan and zoom create an extended desktop — the monitor comes loaded with flashy features and is complete with the ClearVue/GS video card along with step-by-step card installation instructions. Seventy-plus Hz refresh rate keeps the picture steady.

RasterOps ClearVue/GS. *22007* — $1795



22007



One Page At A Time
Get a new view of the world with the PageView full-page display system for the Mac SE, SE/30, or Mac II. In addition to an unbelievably fast 97 Hz refresh rate, this monitor offers three user-selectable screen resolutions — 72 dpi, 80 dpi, and 88 dpi. PageView's Control Panel enables you to select display modes, system font sizes, screen save, dual or single screen operation mode, and cursor size.
Sigma PageView 15" SE. *22101* - $999
Sigma PageView 15" SE 30. *22106* - $1050
Sigma PageView 15" Mac II. *22100* - $1050

MacAvenue is an authorized Sigma reseller.

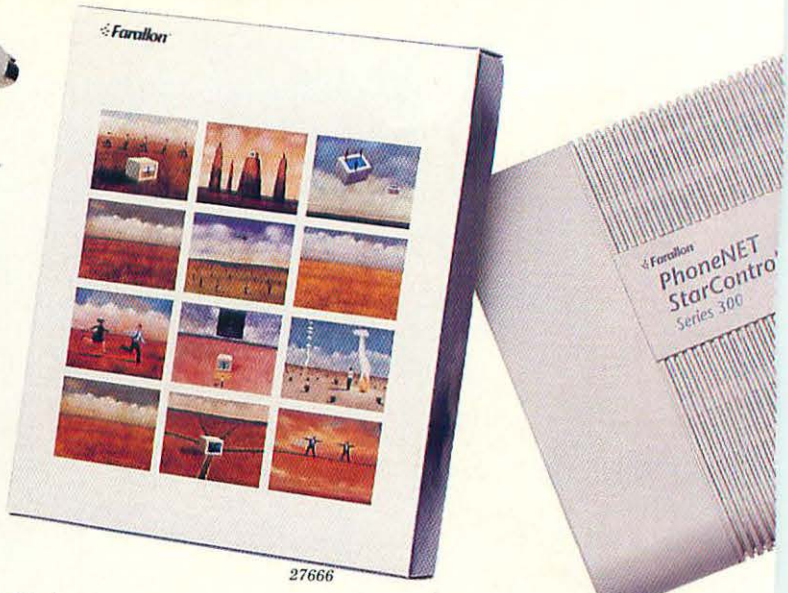
More View For The Mac
Exploit the full power of the Mac II with the Sigma SilverView 21-inch monitor. The 72 DPI display area gives you both single-page and two-page spread displays. A fast-moving 73 Hz refresh rate means you'll never be bothered by a flickering screen. You'll get more precise graphics and better layouts, because you can view full pages and spreads. Customize the monitor to fit your style with the tilt/swivel stand and full contrast/brightness controls.
SilverView Mac II Display System. *22104* - $1599
SilverView SE/30 Display System. *22103* - $1599
SilverView Monochrome SE Display System. *22107* - $1599



22512



22513



27666

Network

Networking Solutions From Farallon
Farallon is the pioneer and the leader in products for reliable networks. Combine Farallon's PhoneNET* products with the twisted pair telephone wiring already running through your office and you have a dependable network for an unbeatable price. Just plug your computer into the wall jack, and you'll be ready to transmit files, send messages, and share peripherals. And Farallon products, like the StarController, let you expand your network without expensive hardware and a tangle of cabling. When it comes to enhancing productivity in your workgroup, a Farallon PhoneNET network is the place to start.

Get The Network Under Control
Install a PhoneNET StarController in your telephone closet to add ease and efficiency to a network of up to 48 nodes. Connect several Star Controllers and you can manage hundreds of users. Takes advantage of existing telephone wiring. Makes connecting to the network as easy as plugging in a phone! Monitors network activity continuously for signs of trouble and protects the rest of the network by shutting down problem ports automatically. Allows network managers to install, re-configure, and manage networks easily from the central phone closet.
PhoneNET StarController. *22516* - $888
Star Wiring Kit Harmonic. *22518* - $64

Connecting The Best
Farallon's PhoneNET StarConnectors make clean connections to the branches of star-configured networks. To get proper resistance and prevent error-causing network reflections, simply plug the pre-terminated Star Connector into the branch device. Comes with Farallon's lifetime guarantee and unlimited phone support.
PhoneNET StarConnector. *22512* - $18
PhoneNET StarConnector 10 pack.
22515 - $138

Farallon Portable Pack.
22519 - $373
PhoneNET DB-9 Connector. *22511* - $34
PhoneNET Din-8 Connector. *22513* - $31
PhoneNET to LocalTalk Adaptor.
22514 - $31
PhoneNET Repeater. *22517* - $313

Add Network Enhancements
Farallon's software and hardware products make your network more productive. Timbuktu* creates a multi-user environment on your Macintosh network — users can operate programs on other networked Macs. Timbuktu Remote lets you take the home office on the road — you can operate another Macintosh from a long-distance connection. And the reliable PhoneNET connector lets you add nodes to your network by simply connecting to a phone jack.

Farallon Timbuktu. *27666* - $95
Farallon Timbuktu Remote.
27668 - $123
Farallon TrafficWatch. *27674* - $127
Farallon PhoneNET 10 Pack.
22534 - $195

The Faster The Better
Make the most of your network investment with the Asanté MacCon Ethernet interface boards. Full compatibility with AppleShare, Novell's Netware and TOPS. Among the fastest Ethernet boards on the market, the Asanté MacCon II/E supports full 32-bit data transfer at speeds up to 10MB/sec, over distances up to a thousand feet.

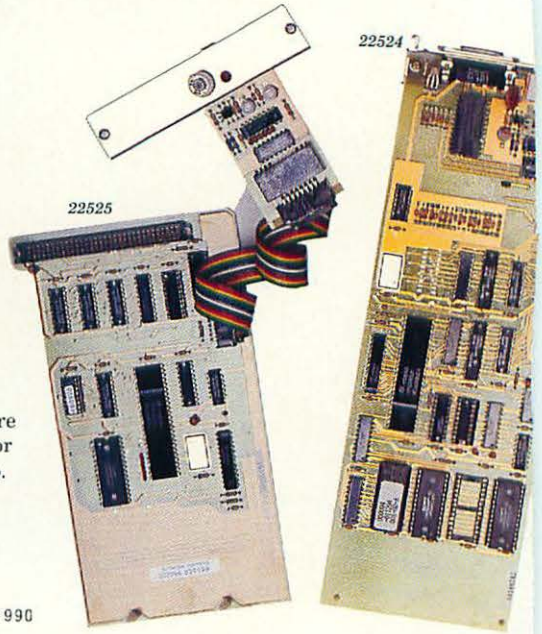
	Mac II	SE	SE/30
Thick	*22524*	*22525*	*22526*
Thin	*22524*	*22533*	*22530*
Twisted Pair	*22529*	*22532*	*22531*
MacCon	**$395**	**$295**	**$395**

Dove Fastnet SE Ethernet card.
22501 - $353
Dove Fastnet III Ethernet card.
22502 - $373
Shiva Telebridge. *22506* - $339



22509

Bridging The Gap
If your network has exceeded the 32-node limit (or slowed to a crawl before it even reached the limit), it's time for a Hayes InterBridge. InterBridge lets you connect local LocalTalk networks or bridge the gap between remote networks equipped with modems. The InterBridge actually enhances overall network performance while it ties networks together. Lets more people communicate and share printers or other devices on connected networks, too. InterBridge Manager software included enables network managers to customize network connection for particular needs.
Hayes InterBridge. *22509* - $645



22524

22525

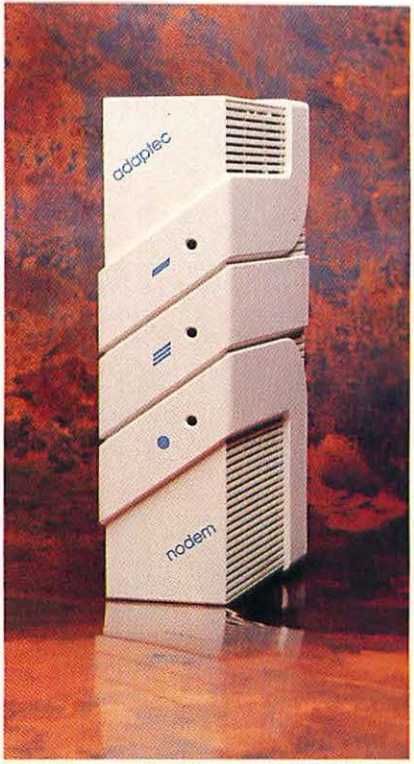


22516

22534

22519

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Crossing Network Borders
You no longer need one box to serve as a gateway, another to share serial devices and a third to connect to remote networks. Now you can connect an EtherTalk LAN and two LocalTalk LANs to create a fully-functional internet. Link the internet to a serial port so all workstations can access peripherals on the other side. Or use the serial port and a modem to connect remote internets. You can even dial in to your internet through EtherGate from a remote Mac or PC with a modem.
Shiva EtherGate. *22508* - $1825

Get All Kinds Of Access
If your workgroup shares peripherals via LocalTalk, now you can share a 2400 or 9600 baud modem as well. Shiva's NetModems enable everyone on the network to transmit data over phone lines. Select the NetModem in the Chooser, start the communications software — and the transmission begins. Flashing messages in the Mac menu bar enable senders to monitor transmissions without leaving the office. And, if you're on the road, you can call the NetModem to send electronic mail.
Shiva NetModem V2400. *22507* - $435
Shiva NetModem V.32. *22528* - $Call

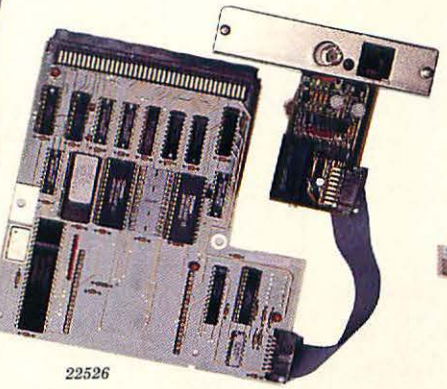
Gaining Speed
If your company is expanding by leaps and bounds, the last thing you need is lacklustre network performance. Give your growing LocalTalk network a boost with Shiva's NetBridge. Plug in two LocalTalk networks and the Shiva NetBridge will make network deterioration a thing of the past. NetBridge is a natural network builder; it doubles your network capacity. Software provided ensures network security and hassle-free network management.
Shiva NetBridge. *22505* - $339

Share And Share Alike
Get the most use from your serial peripheral devices by sharing them on the network. Printers, scanners, high-speed modems, or plotters — the Shiva NetSerial connects most serial peripherals to your LocalTalk network. Offers transfer rates up to 57,600 bit/sec with simple 8-pin, mini-DIN connections.
Shiva NetSerial X232. *22504* - $275

You Gotta Have Connections To Get Anywhere!
Need to connect your Mac to an Ethernet network without losing your internal slot? The Adaptec Nodem lets you do so without compromising network connectivity. The Nodem can also be used as a temporary network "dock" for portable computers. Available for your THICK or THIN (Cheapernet) networking requirements. Compatible with all Macintosh models except 128K/512K.
Adaptec Nodem THICK. *22500* - $395
Adaptec Nodem THIN. *22527* - $395

Another Apple Connection
How can something as simple as a good LocalTalk cable connector be so hard to find? MacAvenue has the answer with its guaranteed LocalTalk connectors. Fits right in to any LocalTalk set-up. Just make the connection and you're in business.

MacAvenue LocalTalk Connectors
DB-9 LocalTalk. *22520* - $32
DIN-8 LocalTalk. *22521* - $32



22526



22505

22504

22508

22507

Communications

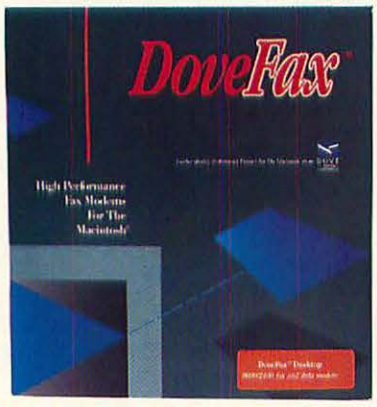
Fax

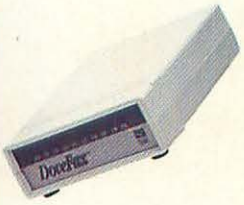
Just The Fax, Ma'am
This indispensable communications unit combines fax transmission, a graphic image scanner, and smooth user interface to your Mac. Sends and receives text and graphics by downloading files from Mac or standard paper input. Quite portable and easy to install. Can also be used as a desktop copier.
Relisys Tefax RA2110. *22700* - $1295


22700

Modems

22701







On The Wings Of A Dove
This ingenious little bird combines a 2400-baud Hayes-compatible data modem and a 9600-baud fax modem to give you communications flexibility to the max. Designed to fit even the most demanding work schedules, the DoveFax sends and receives faxes in the background while you work. The DoveFax can be set up to send messages after hours when phone rates are lower.
DoveFax. *22701* - $270

Mobile Modem
The pocket-sized 2400-baud GVC MiniModem lets you get communications-ready in seconds. This battery-powered unit doesn't even need a cable to send your data. Even though it weighs less than seven ounces, this modem includes advanced design that lowers power consumption — it runs for about six hours on standard 9V battery. Or use the included power adapter to plug into the wall. Includes a carrying case.
GVC MiniModem. *49581* - $159

From One State To Another
If you're a long way from the office but want to keep in touch, the Shiva TeleBridge will make you feel like you're right next door. With a Shiva TeleBridge and a high-speed modem at each location, you can print documents and send electronic mail to the New York office from the beach in Malibu. Only the TeleBridge supports transfer rates up to 57,600 bit/sec. With this equipment, who needs overnight mail service?
Shiva TeleBridge. *22506* - $339

Consider Your Modem Options
Transfer the latest updated files between computers via a MacAvenue modem. All modems are Hayes-compatible and feature auto dial, auto answer, and a built-in speaker.
CompuAdd Modem 1200 baud. *49525* - $89
CompuAdd Modem 2400 baud.
49557 - $129

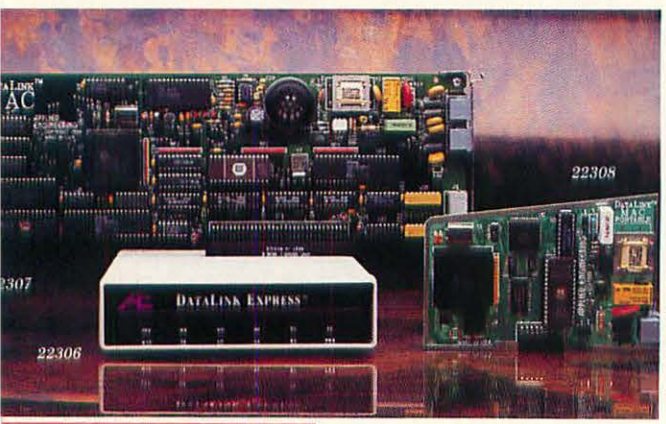
Send It Fast!
Whether you're transmitting vital program code or valuable text documents, using the V-series Hayes Smartmodem 9600 assures maximum reliability for your data. Selects speed automatically on the initial handshake and transmits from 9600 down to 300 baud. On-line compression enhances data throughput, cutting data transmission time in half. Saves operator time by analyzing connection possibilities and choosing the most efficient option. (That means you pay less for transmission time!)
Hayes Smartmodem v.32 9600.
49578 - $895
Hayes Smartmodem 2400. *49576* - $385
Hayes Smartmodem 1200. *49501* - $299
Hayes SmartCom II Software.
27662 - $84



49525



49557



Link Your Mac To The World
The DataLink Mac is an internal 2400 baud modem which includes its own serial port for your Mac II. It can also be upgraded to send fax messages, when you're ready.
DataLink Mac. *22307* - $325

Expressly For The Mac
Hayes-compatible at 300 to 2400 baud, Applied Engineering's DataLink Express is the external modem made expressly for the Mac. Package includes comprehensive communications software.
DataLink Express. *22306* - $215

A Port-A-Modem Deluxe
Designed specifically for the Macintosh Portable, the DataLink/Mac Portable is a state-of-the-art 2400 baud internal modem featuring error correction and a Send-Fax support option. The modem also supports "sleep mode," automatically cutting off power to most of the board when the modem is not in use.
DataLink/Mac Portable. *22308* - $299

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2. Toll-Free Technical Support • 90-Day Product Replacement
Should you experience a problem with anything you purchase from MacAvenue, call our product support staff at 800-766-6221 weekdays from 8:00am to 7:00pm, CST. We will be happy to assist you with any hardware or software difficulty. If we cannot resolve the problem over the phone, we will assign you a return material authorization (RMA) number and a Federal Express shipping number. We will replace the product with equivalent merchandise and pay the shipping both ways.

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For up to one full year after your purchase, MacAvenue will replace or repair (at our option and without cost to you) any product you are not completely satisfied with, and we will pay for return freight to you.

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Input Device

Mice

Turbo Charged!
Trackball users have different reasons for leaving their mouse behind, but the Kensington Turbo Mouse is one of the most popular. Sensing your movements, it adjusts cursor speed accordingly. Move slowly for pinpoint precision. Speed up and the cursor accelerates with you.
Turbo Mouse ADB. *25281* - $107
Turbo Mouse. *25280* - $107

A. Mousing Around
Find yourself in a tangle with your mouse cord? The Mobius Cordless Mouse uses infrared technology to control the cursor up to 20 feet away. Fine-tune mode for smooth, precise cursor control. A separate button controls extra fine and accelerated movement. (Compatible with all Macs.)
Mobius Cordless Mouse. *25282* - $89

B. The Incredible Shrinking Mouse
If you think bigger is better, you've met your match in the Little Mouse from Mouse Systems. This electronic rodent is 22% smaller and 38% lighter than its Apple counterpart. And it's not only smaller, it has higher resolution — 50% higher resolution that takes you to 300 counts per inch. Uses 100% optical technology that makes the rolling ball a thing of the past. And don't worry about buying your new mouse the proper optical pad — a free mousepad is included.
Little Mouse. *25283* - $77
Little Mouse Trackball. *25284* - $72

Keyboards

A Key Part Of Your System
An extended keyboard that works with *any* Macintosh, the DataDesk MAC 101 adds all the F-Keys and other key commands — even to an older Macintosh. So, if you have a Plus or earlier Mac, you have real cause to celebrate. Costs less than the Apple model, too!
MAC-101 Keyboard, ADB. *25180* - $134
MAC-101 Keyboard, Beige. *25181* - $134

C. Have It Your Way
If you've been dreaming of a keypad on the left side of the keyboard, your time has come. The SWITCHBOARD, the first modular keyboard for the Macintosh, gives "user-friendly" a whole new meaning. The keypad and cursor key can be on the left or right — you decide. Put the pieces together in any configuration that makes you happy.
The SWITCHBOARD. *25182* - $174
The SWITCHBALL. *25183* - $115
15 Function Key Module. *25184* - $37

Scanners

D. Handmade
If you need to scan images into your Macintosh documents but can't set up an elaborate scanning station, try the hand-held ScanMan from Logitech. You'll get 32 shades of gray in photographs, drawings, logos, and illustrations up to four inches wide. Connects directly to the Mac SCSI for easy installation. Resolution from 72dpi to 400dpi delivers a quality image both on screen and on paper.
ScanMan 32. *22751* - $317

The Future Is In Color
The MicroTek 300Z Color Scanner is a full-featured color scanner at a gray-scale price. Get 16.8 million colors with 256 shades of gray and 24-bit color at 300dpi. Includes SuperPaint and Digital Darkroom.
MicroTek 300Z Color Scanner. *22755* - $2049

MicroTek MS-II B&W Scanner. *22756* - $1080
Complete Page Scanner. *22753* - $758
Complete Halfpage Scanner. *22752* - $313
ThunderScan Plus. *22757* - $199

Sound

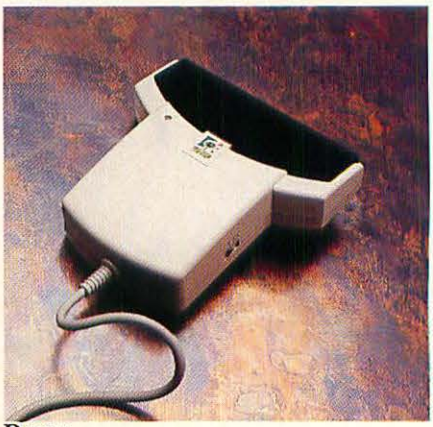
E. Music Master
The PassPort MIDI Interface opens up the world of music on your Mac. Installation is simple — PassPort MIDI draws its power from the Mac so it requires no additional adapter. It actually allows you to connect *several* instruments in a daisy-chain.
PassPort MIDI Interface. *23732* - $76

Put That On The Record
Add sounds to the sights in your presentations. MacRecorder digitizes sound from any source — the audio digitizer has a built-in mic — and gives you the tools to edit the recording. Special effects included.
MacRecorder. *23730* - $162

Digitizers

F. Super Big Chief Tablet
Brings a tear to the Big Chief's eye. The SummaGraphics BitPad Plus digitizes information as you "draw" on the tablet. Trace drawings or sketch freehand. Then, in a wink, view the final image on your monitor screen. The BitPad Plus also performs all mouse functions — guides the cursor, selects icons, and opens files.
SummaGraphics BitPad Plus. *26885* - $318

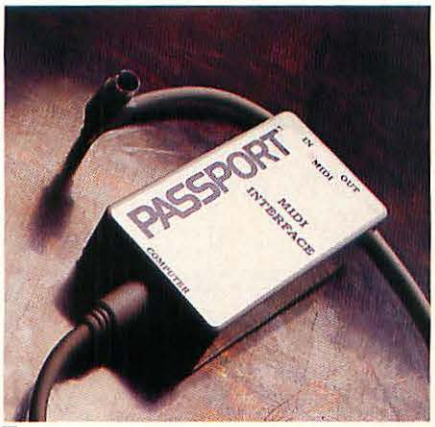

C *25182*


D *22751*


A *25282*


B *25283*

Electronics



E *23732*

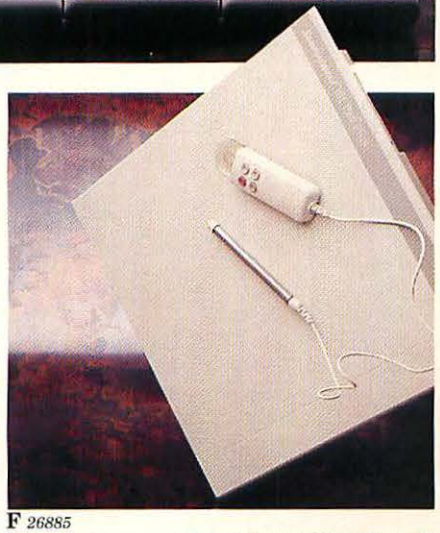
Power Supplies

G. Don't Stop The Power
When a surge suppressor just doesn't offer enough protection, plug your Mac into an Uninterruptible Power Supply from American Power Conversions. This UPS draws on its battery to keep your system running after a power failure until you can back up and exit properly. The UPS can even initiate an unattended network shutdown when you install it on a network server.
Uninterruptible Power Supply.
26292 - $275





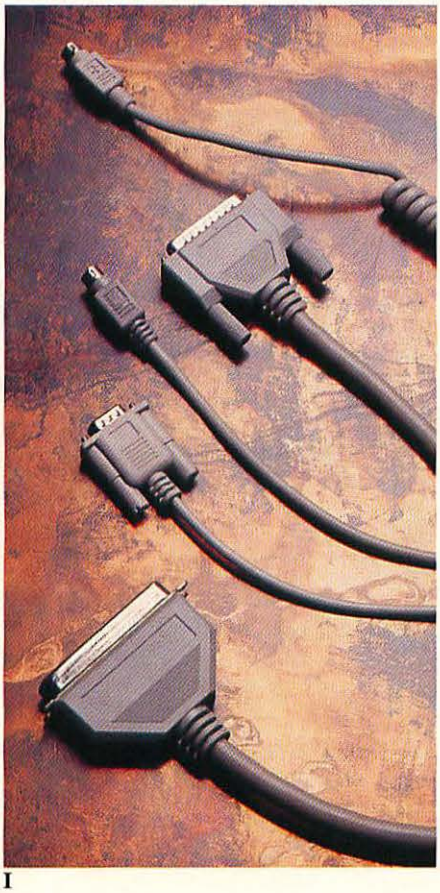
H *26880*



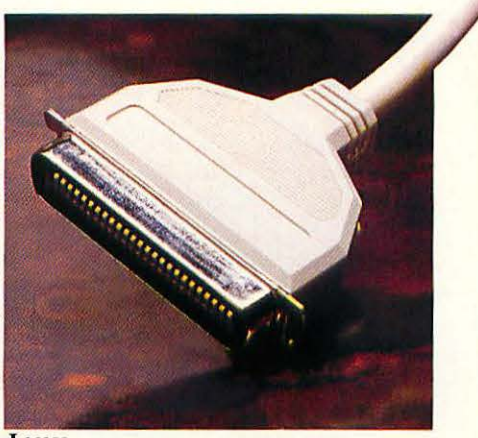
F *26885*



G *26292*



I



J *26288*

Accessories

H. Heat Up, Cool Down
When things heat up, you can keep your Mac cool with the Mobius Fanny Mac, a combination cooling fan and surge suppressor for your 512K or Plus. Pulls cool air through to keep memory and/or internal drives from overheating.
Mobius Fanny Mac. *26880* - $58

Dial "A" For Automatic
Install HyperDialer, open your HyperCard phone file, and you're ready to dial any number at the click of your mouse. Also dials phone numbers from QuickDex, Focal Point, Sidekick, and SuperCard address books. *No modem required.*
HyperDialer. *26886* - $32
Kensington System Saver, MacPlus. *26888* - $62
Kensington System Saver, Mac SE. *26889* - $62
TrippLite Surge and Noise Suppressor. *40510* - $29

Connectors

I. We'll Make Your Connections
When you're building a Mac system, use quality MacAvenue cables.
MacPlus, SE, Mac II to Hayes-compatible modem. 6 ft. *26285* - $9
MacPlus, SE, Mac II to Imagewriter II. 6 ft. *26287* - $9
MacPlus, SE, or Mac II to Imagewriter. 6 ft. *26286* - $9
Mac to SCSI System cable. 2 ft. *26280* - $11
Mac 128/512 to Hayes-compatible modem cable. 6 ft. *26281* - $8
Mac 128/512 to Imagewriter. 6 ft. *26282* - $8
MacPlus, SE, II to AP modem. 6 ft. *26284* - $9

J. SCSI Extension Cable
SCSI Extension cable. 6 ft. *26288* - $25
Mac to SCSI System cable. 6 ft. *26290* - $22
SCSI Peripheral cable. 6 ft. *26289* - $25
SCSI Peripheral cable. 6 ft. *26291* - $25
MacPlus Peripheral Adapter cable. 6 ft. *26283* - $8
Extra long ADB keyboard cable. *26900* - $24

Accessories



A.

Carrying Case

A. Hit The Road
Move your Mac in safe style with this padded, water-repellent nylon case. Features locking accessory pocket for disks and fully padded compartments for keyboard and mouse. There's even room for your hard disk drive.
MacAvenue Carrying Case. *26898* - $65
MacAvenue Extended Keyboard Carrying Case. *26901* - $76
MacPlus/SE Dust Cover. *26894* - $8
Imagewriter II Dust Cover. *26895* - $8
LaserWriter II Dust Cover. *26897* - $12

Stands

B. Space: The Last Frontier
Free up space on your desktop — stand your Mac II CPU securely on its side beneath your desk so just your monitor and keyboard are left in front of you. Kensington kit includes a stand to support the Mac II and extra-long cables for your monitor and keyboard.
Kensington Mac II Stand and Cable Kit. *26892* - $63

Get A Better Look
Stop craning your neck and slumping over in your chair to see your Mac screen! Use a Kensington Tilt/Swivel stand to get a better angle on the computer screen. Tilts to a twenty-degree angle (*your neck isn't THAT long*) and swivels all the way around (that's a three-sixty). Fits standard Mac CPU monitors.
Kensington Tilt/Swivel Stand. *25582* - $21

C. Standing Tall
This printer stand supports most dot-matrix printers, including the Imagewriter. Raises the front 2.5 inches and the back 4 inches to allow you to monitor the printing. Offers paper storage under the printer and paper catcher to keep copy neat.
Kensington Universal Printer Stand. *26896* - $15
Mac II Monitor Stand. *25580* - $62
Mac II System Stand. *26887* - $20
Mac II Monitor Extension Kit. *26899* - $32

Monitor Accessories

D. Stop Glaring At Me!
A glare off your computer screen can be annoying, cause red eyes and give you a headache. A Kensington Anti-Glare Filter reduces screen glare by 91% and improves screen clarity more than 15 times. Attaches to any Macintosh nine-inch monitor with adhesive fasteners — no tools required. Save your sunglasses for the times when you just want to *look* cool.
Anti-Glare Filter, Beige. *26882* - $32
Anti-Glare Filter, Platinum. *26883* - $32
Apple RGB Anti-Glare Filter. *26891* - $62

Et Cetera

E. Keep It Clean
Even a speck of dust is too much for sensitive electronic equipment, so use the MacAvenue Data-Vac to keep your system clean. This vacuum/blower comes with three cute little attachments that nose into every cranny. We'll throw five backup vacuum bags into the deal!
MacAvenue DataVac. *41026* - $49

F. Fine Art For Your Mac II
Finally, the perfect power control center for your Mac II. The Kensington Masterpiece organizes your power cords with a special computer outlet, four individually switched peripheral outlets, and one convenient master switch. Surge suppression and noise control protect your entire system, and a separate filter protects your modem data from electrical disturbances on the phone line. And if all of this isn't enough, Masterpiece also has a built-in swivel base for adjusting your monitor to that perfect position.
Masterpiece Mac II. *26893* - $103

Keep Your Mac From Wandering
The Kensington Security Kit tethers your Mac CPU, monitor, and keyboard so they stay where you put them using Apple's built-in security slots. The kit's unique screwdriver and tamper-resistant screws will lock up peripherals, too. Also fits the Apple II GS.
Kensington Security Kit. *26884* - $33

G. Now You See It, Now You Don't
This keyboard drawer holds all standard and extended Mac keyboards, saves desk space, and allows you to get your keyboard out of the way when you need space to think. Up to 22.25" x 9.5" x 2.25".
MacAvenue Keyboard Drawer. *41753* - $19

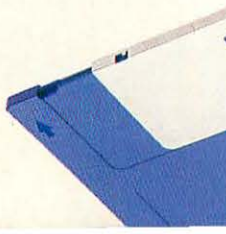
Data Storage

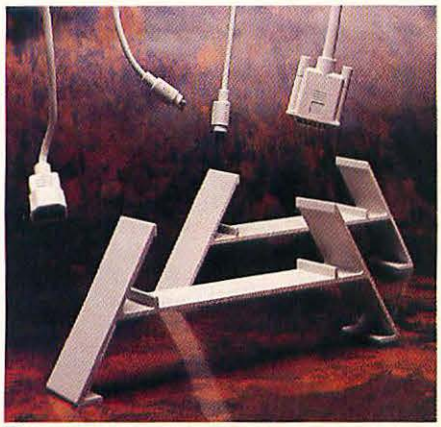
H. Wood That It Were
If you enjoy the natural look and feel of wood in your office space, stash your diskettes in one of MacAvenue's teak boxes. Two sizes.
MacAvenue Teak 3.5" single row. Holds 45 diskettes. *41600* - $20
MacAvenue Teak 3.5" double row. Holds 90 diskettes. *41601* - $29

I. The Medium Is The Message
Trust your data to the best name in the business — SONY. High-quality diskettes mean that you'll have safer storage and transportation of your valuable information. Check MacAvenue's *everyday low prices* on diskettes and cartridges.
Sony 3.5" Diskettes, 800KB, 10 pack. *57401* - $15
Sony 3.5" Diskettes, 1.2MB, 10 pack. *57440* - $29

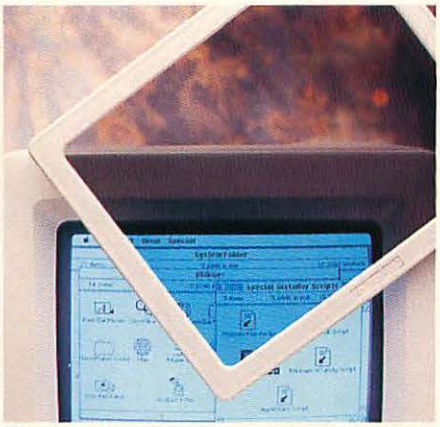
QT-Mac Data Cartridge 80MB, 2 pack. *26080* - $85
20MB 5.25" Bernoulli Cartridge 3 pack. *57805* - $199
5.25" 1.2MB Diskettes, 10 pack. *57200* - $10.99
5.25" 360KB Diskettes, 10 pack. *57000* - $4.99

J. Need A Librarian?
Get rid of that shoebox you've been storing your disks in! Make a disk storage breakthrough with The Library. This unit holds 80 Mac disks and sits on a carousel base to allow easy access to all disks at once. And, if you really want to get into a serious library mode, stack three units and have an entire 240-disk collection at your fingertips. There's an index panel on each side so you can keep up with where you're hiding your data. The Library takes about nine square inches of desk top, and is only six inches high, so you'll be saving desk space as well as storage space.
The Library *(Gray) 26903* - $12
The Library *(Black) 26904* - $12

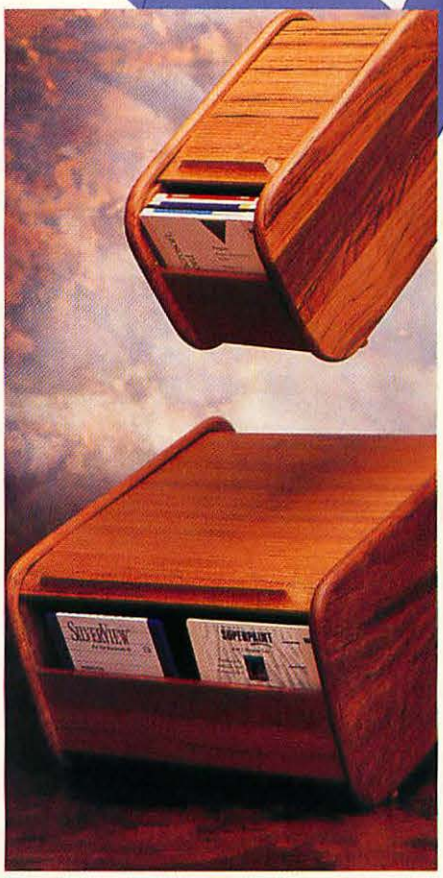




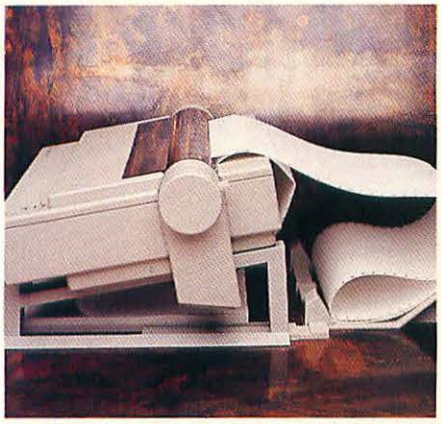
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D *26882*



H *41600, 41601*



C *26896*



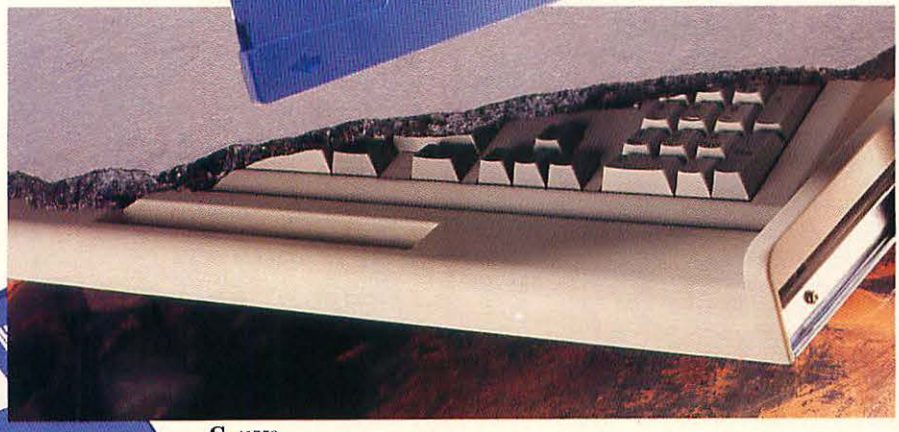
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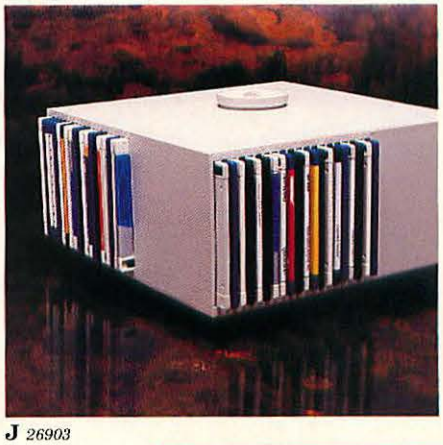
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I *57440*

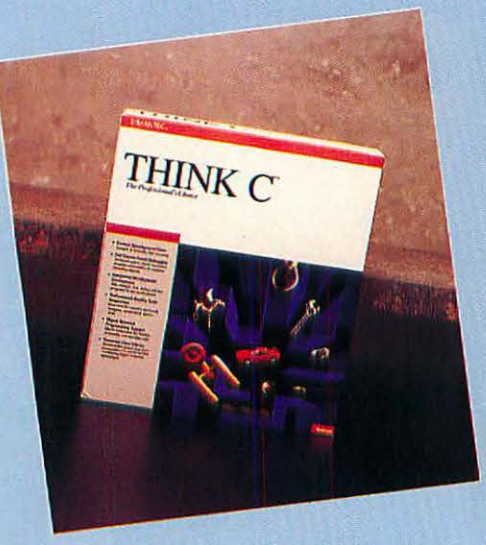


G *41753*



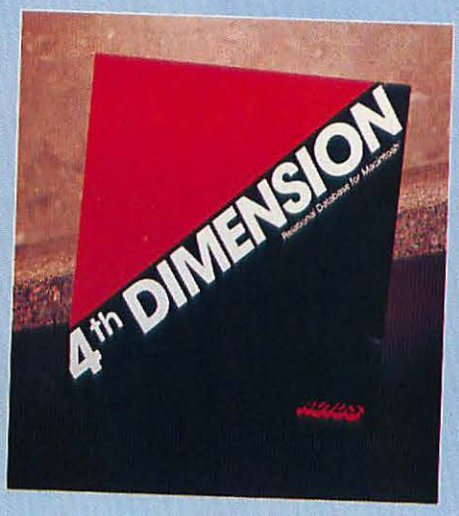
J *26903*

MacAvenue Features



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Flash from concept to product in the blink of an eye. With Think C's fast compiler and linker, programming time shrinks to no time. Devise new applications, DAs, INITs, drivers, or HyperCard functions in this powerful but flexible programming environment. Whether you choose object-oriented programming or procedural programming, Think C will help you build and manage your program with maximum efficiency.

Think C. *27586* - $163.00



Into A New Dimension
4th Dimension gives you the speed and flexibility you need to get the most mileage out of your data. With 4D, you can create forms, generate detailed reports, print mailing labels, and transmit data to other machines — all from within the Macintosh interface you already know. And when it's time to develop serious special applications for your database, 4th Dimension runtime, gives you even more power and options to meet your programming needs.

4th Dimension. *27780* - $511.00
4th Dimension Runtime. *27782* - $85.00



Born On The Fourth of July
If you leave your computer on too long, it will burn itself out. Install Pyro! and you can enjoy safe fireworks and a safe screen. When your computer is left on, this Control Panel Device (CDEV) kicks on automatically and prevents phosphor burnout in your monitor by replacing the screen image with random visual pyrotechnics.

Pyro! *30399* - $21.00

Word Processing

Acta Advantage	*30606* -	$63.00
Big Thesaurus 1.0	*30618* -	$63.00
Findswell	*30594* -	$35.00
FullWrite Professional	*30600* -	$253.00
Microsoft Works	*30580* -	$177.00
Micrsoft Word	*30582* -	$245.00
Microsoft Write	*30584* -	$77.00
Nisus	*30602* -	$236.00
OmniPage 2.0	*30610* -	$535.00
QuickLetter	*30598* -	$72.00
Spelling Coach Pro 3.1	*30620* -	$112.00
Spellswell	*30596* -	$44.00
WordFinder 2.0	*30622* -	$31.00
WordPerfect Mac	*30590* -	$227.00
WriteNow	*30588* -	$116.00

Office Programs

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BulkMailer Plus	*27814* -	$187.00
KeyPlan	*27810* -	$243.00
Microsoft Office Bundle	*30182* -	$525.00
Microsoft Works	*30580* -	$177.00
More II	*30604* -	$243.00
Paracomp Milo	*27806* -	$156.00
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Programming

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HyperCard	*29210* -	$60.00
Just Enough Pascal	*27582* -	$51.00
Prototyper	*27588* -	$183.00
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SuperCard	*27580* -	$127.00
Think C	*27586* -	$163.00
THINK Pascal 3.0	*27584* -	$160.00
Turbo Pascal	*27592* -	$67.00

Database

4th Dimension	*27780*-	$511.00
4th Dimension Runtime	*27782*-	$85.00
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Data Desk Professional	*27818* -	$347.00
dBASE Mac	*27800* -	$Call
dBASE Mac/Runtime	*27802* -	$Call
Double Helix	*27804* -	$327.00
FoxBase II	*27790* -	$292.00
FoxBase II Runtime	*27792* -	$176.00
FoxBase MultiUser	*27794* -	$385.00
FoxBase MultiUser Runtime	*27796* -	$293.00
Microsoft File	*27798* -	$123.00
MySoftware MailList	*27816* -	$49.95

Spreadsheets

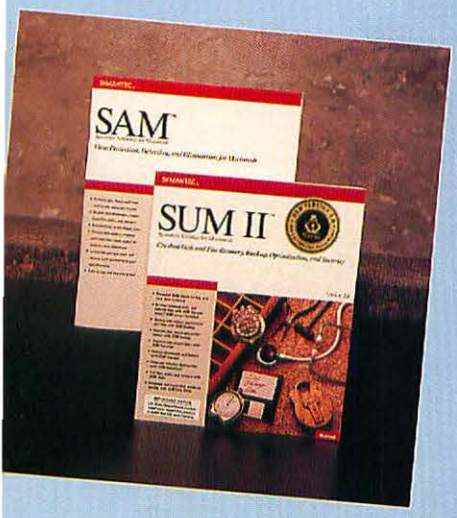
Full Impact	*30186* -	$245.00
Microsoft Excel	*30180* -	$245.00
101 Macros for Excel	*28476* -	$35.00
Wingz.	*30184* -	$245.00

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101 Scripts & Buttons	*30426* -	$35.00
Address Book Plus	*30442* -	$48.00
Affinifile	*30350* -	$44.00
AfterDark	*30424* -	$24.00
Calendar Creator	*30432* -	$36.00
CanOpener	*30348* -	$63.00
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Play It Again, SAM (And SUM)
Stop a virus before it starts with Symantec's AntiVirus for the Macintosh (SAM). On-line help takes the guesswork out of scanning suspicious files or folders. When SAM detects any viral activity inside your Mac, it deletes the deviant code immediately. Sleep peacefully, knowing your data is safe, with the help of SAM's brother, SUM II, Symantec's Utilities for the Macintosh. SUM II maintains dependable backups, recovers lost data, guards against crash damage, and secures your hard drive from spies.

SAM. *30342* - $63.00
SUM II. *30340* - $92.00



Buy A Money Manager
Managing Your Money keeps tabs on every aspect of your personal business. When you write a check, MYM will carry the information not only to your checkbook balance, but also to your budget, cash flow report, tax estimator, and even to your net worth statement. This program also keeps you posted on your loans and accounts payable or will draw data to create dozens of financial reports. In addition to keeping your accounts straight, Managing Your Money will track several investment portfolios holding bonds, mutual funds, stocks and options.

Managing Your Money. *28462* - $122.00



It's Money That I Love
Bypass painful bookkeeping chores with Quicken, the helpful money management program that costs you less than an hour with an accountant. Keep tabs on your expenses, watch the bottom line of your small business, and track your personal income — simply, easily, and all at the same time. Quicken writes and addresses checks, reconciles your bank statement, and updates you on your budget. Save yourself the monthly headache. Get Quicken!

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TOPS for the Macintosh	*27682* -	$Call
TOPS InBox Connection	*27690* -	$41.00
TOPS InBox Starter	*27688* -	$143.00
White Knight	*27664* -	$89.00
Microsoft Mail - Server	*27678* -	$246.00
Microsoft Mail - 20 Pack	*27680* -	$965.00
NetPrint V.2.0	*27686* -	$115.00
Quickmail 10 Pack	*27696* -	$246.00
Quickmail 5-User	*27695* -	$210.00
Quickmail Remote	*27692* -	$32.00
SmartComII	*27662* -	$84.00

Scheduling

Claris MacProject II	*29740* -	$366.00
C.A.T.	*29742* -	$225.00
Fast Track Schedule	*29744* -	$108.00

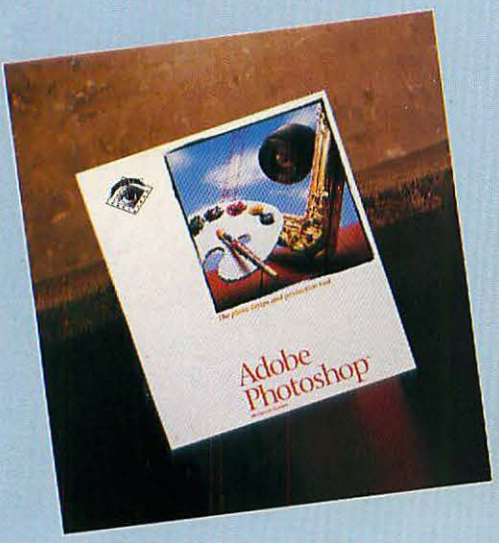
Money Management

Accountant, Inc. Prof.	*28481* -	$348.00
Business Sense Prof.	*28466* -	$265.00
Checkwriter II	*28468* -	$37.00
Dollars & Sense	*28464* -	$78.00
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Insight Accounts Receivable	*28442* -	$395.00
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Insight At Once	*28454* -	$283.00
Insight General Ledger	*28444* -	$395.00
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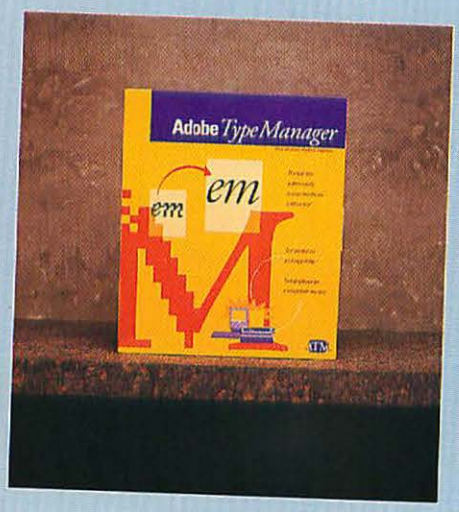
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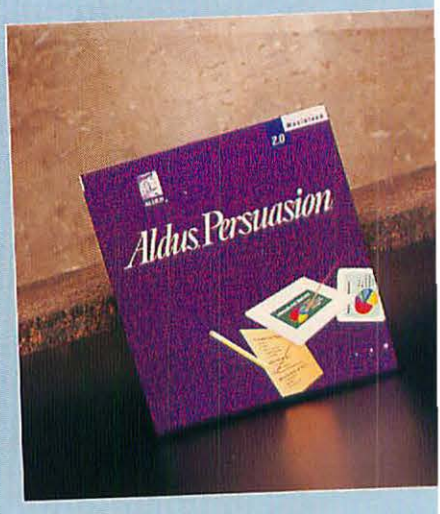
Software To Maximize



Master Image Manipulator
Adobe PhotoShop lets you alter any image in any number of ways. Start with a scanned image, an image you've captured from video, or original art. You can retouch, enhance, or manipulate the image by filling an area with color, adding lines, or spraypainting over the screen. Whether you're an artist working with a collage or a photographer airbrushing a scanned photo image, the PhotoShop tools give you incredible options. When you're ready for production, PhotoShop lets you color correct, alter brightness or contrast, and change the resolution of your image.
Adobe PhotoShop. *29266* - $498.00



Beyond The Jagged Edge
Forever banish jagged edges on the bit-mapped letters of your screen fonts!! Adobe TypeManager gives you the smooth-edged look of PostScript type while it dramatically improves the output of your non-postscript printer. By eliminating the need to store several sizes of each font, TypeManager preserves valuable storage capacity on your hard drive.
Adobe TypeManager. *29824* - $55.00



Present Yourself In The Best Light
Impress your clients, your boss, or just your friends. With Aldus Persuasion you can outline your thoughts, develop a slide presentation, and generate printed handouts for your audience all at once. Begin with one of Persuasion's templates, complete with charts and graphs, or use your own unique format to make believers out of skeptics. You can even produce a self-running trade show demo.
Persuasion. *29782* - $337.00

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Adobe Illustrator 88	*29788* -	$275.00
Adobe Photo Shop	*29266* -	$498.00
Canvas	*29232* -	$186.00
Click Art Business	*29252* -	$32.00
Click Art Christian	*29256* -	$37.00
Click Art Holidays	*29254* -	$32.00
Cricket Draw	*29234* -	$138.00
Cricket Paint	*29236* -	$176.00
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Smart Art 3	*29250* -	$83.00
Super3D	*29226* -	$313.00
SuperPaint	*29222* -	$124.00

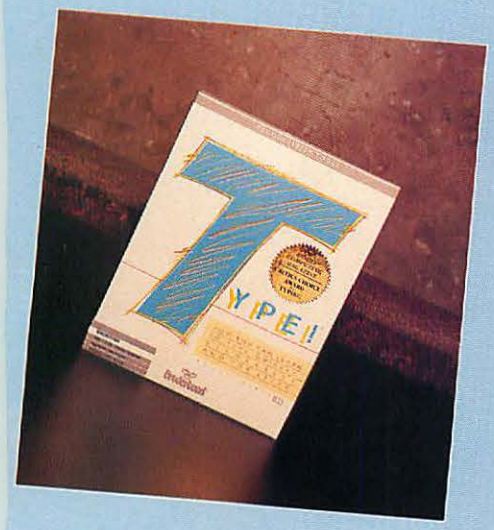
Publishing/Presentation

Adobe Fonts: 134 available		Call
Adobe TypeManager.	*29824* -	$55.00
Certificate Library	*29810* -	$17.00
Certificate Maker	*29808* -	$21.00
Claris CAD	*29206* -	$589.00
Claris MacDraw II	*29204* -	$291.00
Claris MacPaint II	*29202* -	$94.00
Claris Smartform Designer	*29200* -	$291.00
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LetraStudio	*29794* -	$273.00
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Ready-Set-Go	*29792* -	$273.00
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QuarkStyle 1.0	*29800* -	$165.00
Silicon Press	*29796* -	$51.00
Springboard Publisher	*29814* -	$107.00
Top Honors	*29812* -	$57.00
TypeAlign	*29826* -	$58.00
Videoworks II	*29208* -	$185.00
Videoworks II Accelerator	*29212* -	$119.00
Videoworks II HyperCard	*29210* -	$60.00

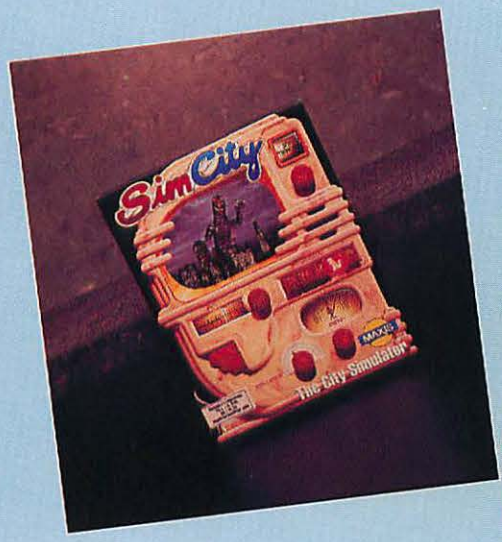
Education

Atlas Explorer	*27956* -	$27.00
Broderbund Physics	*27966* -	$57.00
Broderbund Geometry	*27962* -	$57.00
Broderbund Calculus	*27964* -	$57.00
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First Shape	*27982* -	$31.00
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KidsTime	*27988* -	$24.00
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Unicorn Math Wizard	*27950* -	$26.00
Unicorn Read-A-Rama	*27954* -	$31.00

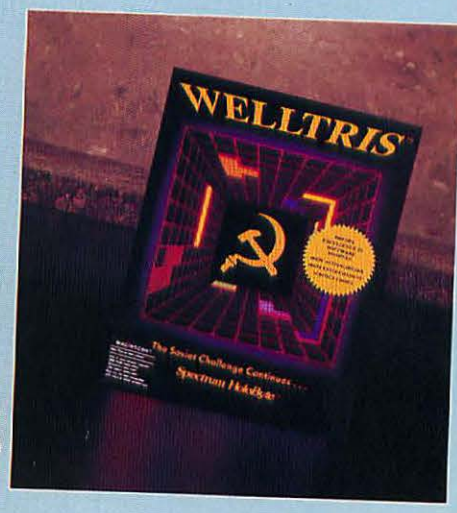
Your Macintosh



More Words Per Minute
If the "hunt and peck" method just isn't getting your work done fast enough, Type! will set your fingers flying over the keyboard in a few short sessions. Type! is a program that entertains users while it teaches them how to improve typing skills with each hand — even with each finger. Type! is the result of scientific research on how people actually learn to type; it was designed not only to tell you where your errors are but to teach you to correct them — on the spot — and then build more productive typing skills.
Type! *27958* - $18.00



It's Your Town
Are you a model citizen? Or does every policeman know you by your first name? It doesn't matter in SimCity, because you're the boss. Build the perfect city — full of ideal renewal projects — or create the most bizarre urban landscape you can imagine. Raise taxes, lower taxes, stop taxes. You're the mayor, the planner, the cop on every beat. You can even cause natural disasters in SimCity. And the Sims — the simulated humans that live in your city — always respond to your decisions.
SimCity. *28678* - $28.00
SimCity Supreme *28680* - $47.00



Foreign Fun
If Tetris is your favorite computer game, you owe it to yourself to try Welltris. Designed by the Alexey Pajitnov, the father of Tetris, Welltris takes you into a three-dimensional screen where you fit pieces into a four-walled grid. Just to keep you on your toes, Welltris offers three levels of complexity with five game speeds in each level. Unlike Tetris, some of the pieces are randomly generated and become more complex at each new level of play.
Welltris. *28604* - $18.00

Games

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Ancient Art of War at Sea	*28670* -	$25.00
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Beyond Dark Castle	*28646* -	$31.00
Bomber	*28738* -	$25.00
Chuck Yeager Flight Simulator	*28656* -	$30.00
Colony	*28634* -	$28.00
Cosmic Osmo	*28700* -	$40.00
Crossword Magic	*28638* -	$28.00
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Crystal Quest w/editor	*28706* -	$39.00
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Manhole	*28696* -	$28.00
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ever programs go when no one sells them anymore. Second came the Attack of the Ninja Feminists. Certain critics of the female persuasion vehemently objected to MacPlaymate's obvious misogyny. Maybe it was the bondage that did it. In any event, the fellow who had taken to distributing the program by then rose to the challenge and proudly defended MacPlaymate on such prestigious television forums as *Entertainment Tonight* and *Geraldo*.

Farnham's Choice

This staunch defender was none other than Chuck Farnham, whom readers of this column will remember as the self-appointed gadfly known for rooting around in Apple's trash cans. One of Farnham's myriad enterprises is Digital Deviations, whose products include the infamous SmutStack, the Carnal Knowledge Navigator, and the multiple-disk set Sounds of Susan. The last comes in two versions: a $15 disk of generic sex noises and, for $10 more, a personalized version in which the talented Susan moans and groans using your name. I am not making this up.

Farnham is frank about his participation in the Macintosh smut trade. "The problem with porno is generic," he says, sounding for the briefest moment like Oliver Wendell Holmes. "When you do it, you have to make a commitment . . . say you did it and say it's yours. Most people would not stand up in front of God and country and say, 'It's mine.' I don't mind being called Mr. Scum Bag."

On the other hand, he admits cheerily, "There's a huge market for sex stuff." This despite the lack of true eroticism. "It's a novelty," says Farnham. Sort of the software equivalent of those ballpoint pens with the picture of a woman with a disappearing bikini.

From Grade School to Junior High

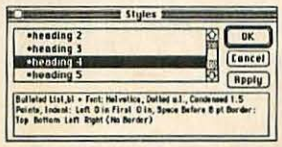
So we're back to the original question —if this stuff is only a silly novelty, why is someone as talented as Mike Saenz bothering with it? When I contacted Saenz at his artist's loft in Chicago, I found that he really wasn't able to give me a coherent answer. "I cre-

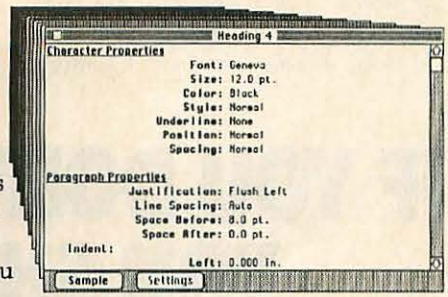
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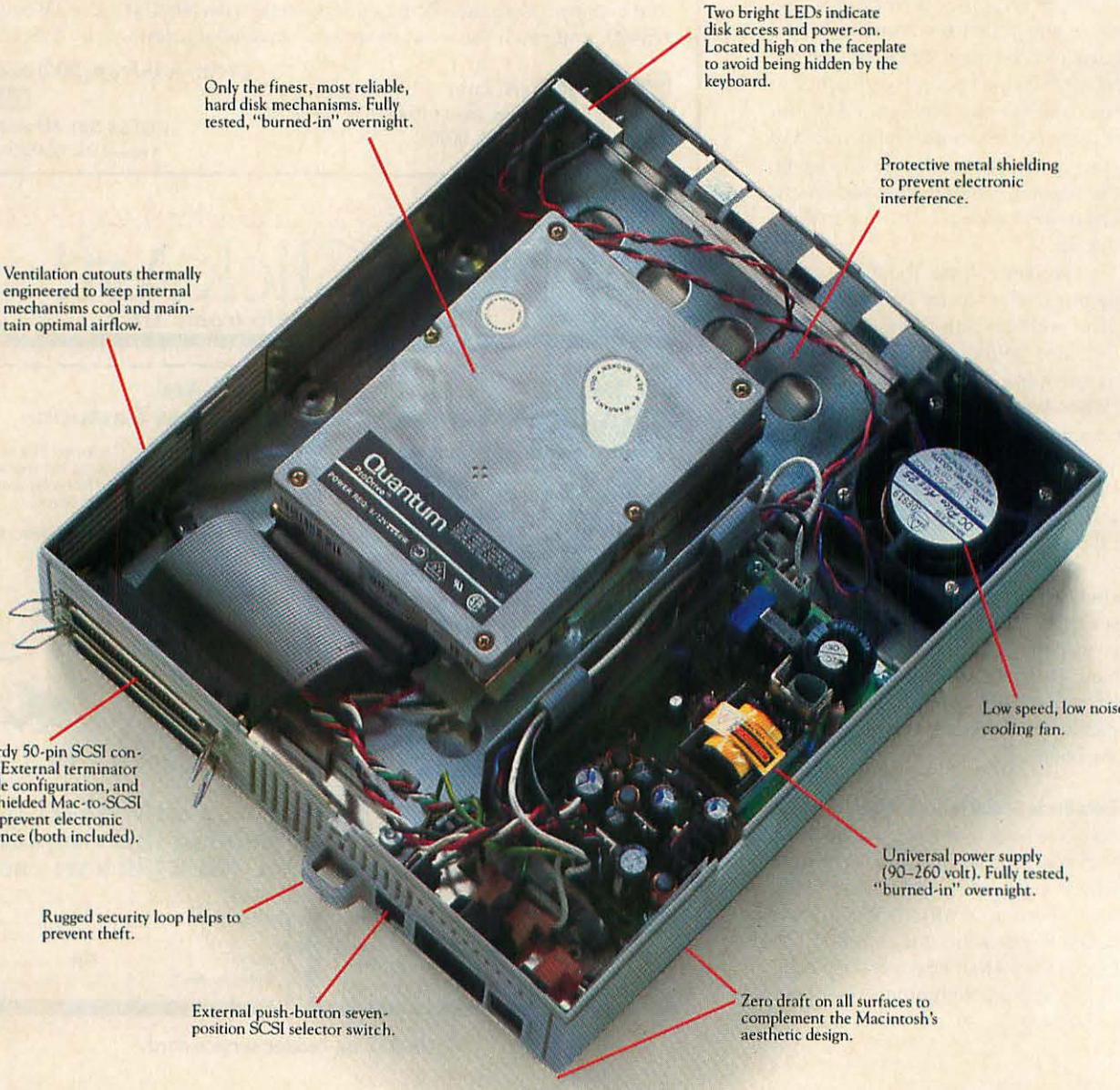
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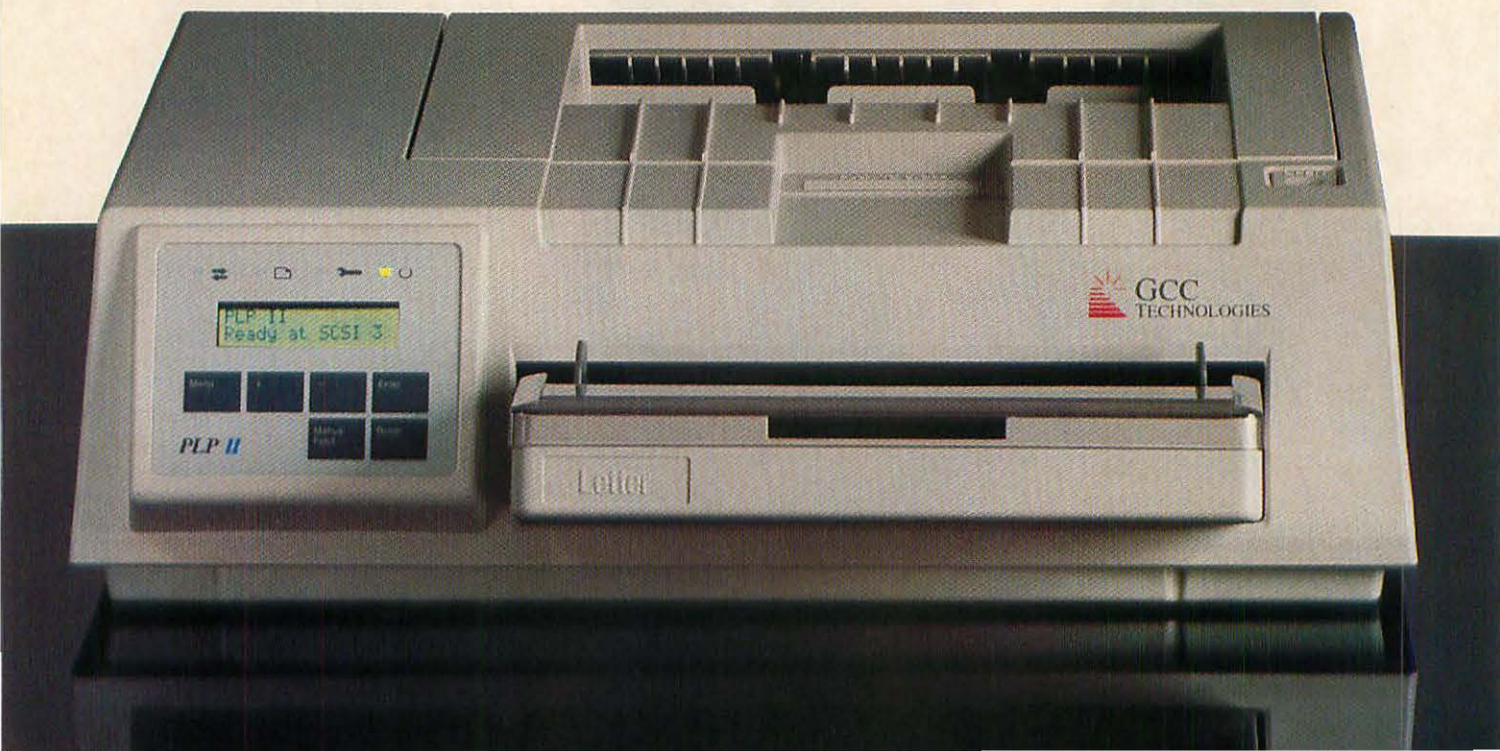
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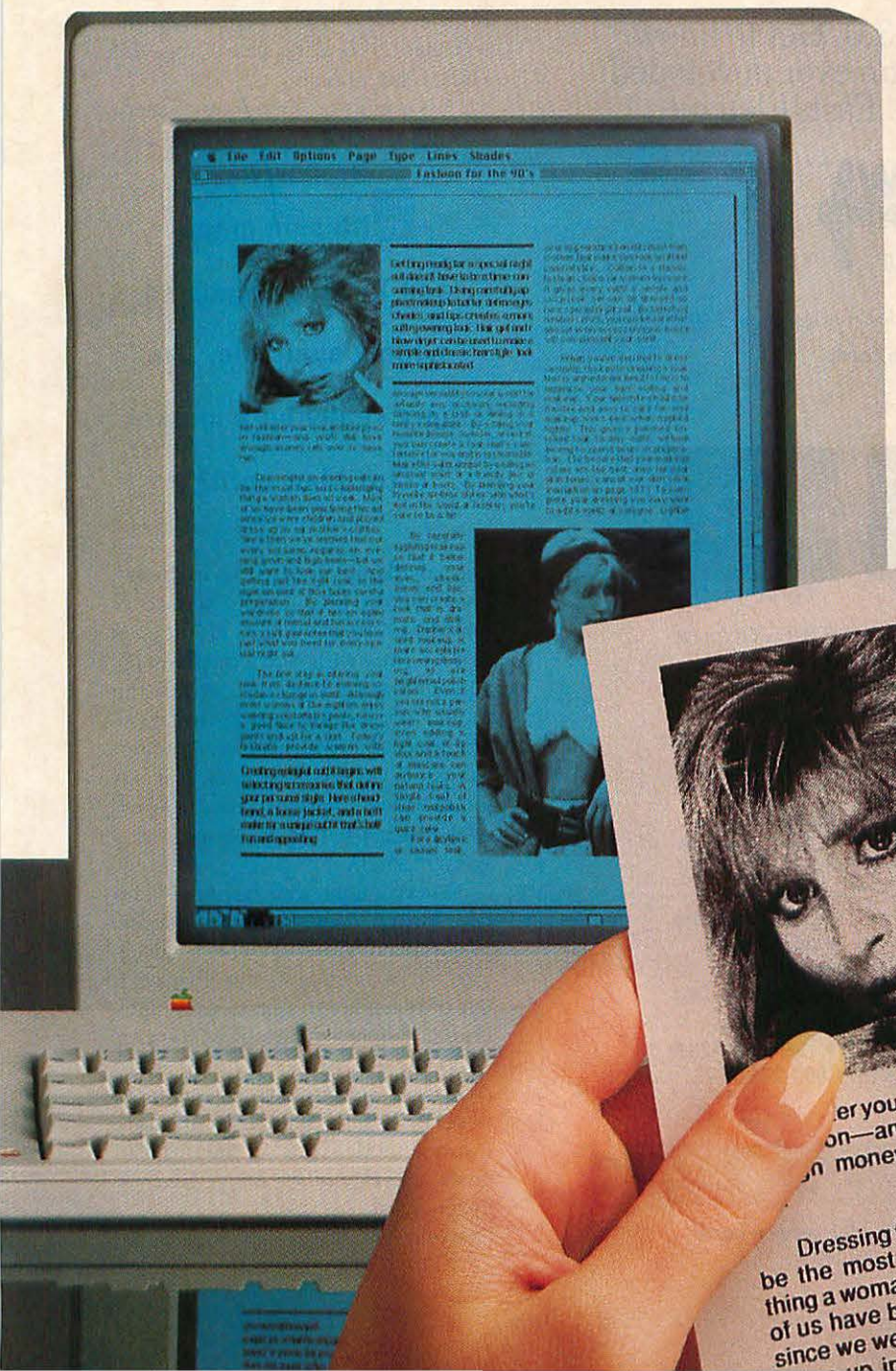
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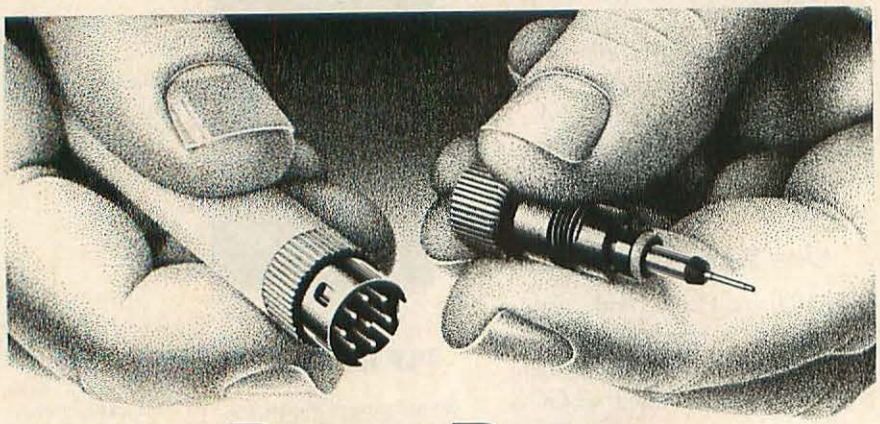
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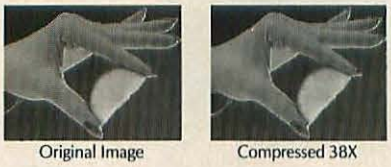
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ated Reactor because I was fed up with the grade-school level of entertainment on computers," he says. "I felt it was 1990, better get with it—do an R-rated entertainment company."

But just as quickly he concedes that the sex in Virtual Valerie is "a lame X." The reason for the lameness, he says, is that he messed up—certain files that would have enlivened the erotic nature of the program were unintentionally omitted from the version sent out to the CD manufacturer. As a result, Saenz is quick to admit, the salacious promotional flyer for Virtual Valerie is misleading. And when I point out that the nonsexual material on the disk is much better than the so-called erotica, he insists that this effect is intentional.

It's confusing. One minute Saenz says he felt that the sex would be a good marketing tool to expose his talents, and the next minute he talks of his "damn-the-torpedoes attitude" in proceeding with the controversial subject matter. The more we talk the more it becomes clear that Virtual Valerie was not so much a direct attempt to cash in on sexual material as it was a half-baked attempt to toss in whatever Reactor had in the hopper at a given moment.

With skin mags and X-rated videos so widely available, can there really be a market for Mac porn?

There might well be those who take Virtual Valerie seriously enough to complain about its implicit misogyny. Saenz bristles at this charge. "I am of the opinion that pornography does not represent misogyny," he says. "I do see the porno *industry* as exploitative—getting actual women to pose, that's all real tragic. But I don't use real models. It's on the order of erotic art. Hey, it's a drawing—pure imagination.

(continues)

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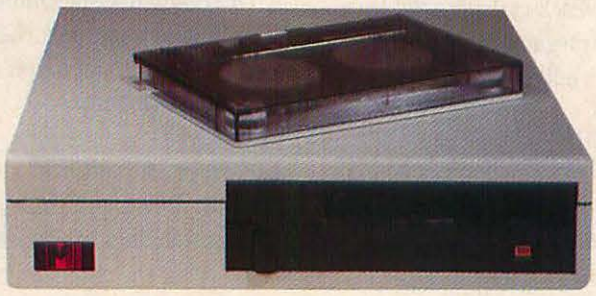
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"The only negativity I've gotten so far was at the Expo, when one woman came up and watched in anger. Then something happened that made her laugh. She finally shrugged her shoulders as if she'd decided that boys will be boys. How do you change human nature?"

The X in Macs

So there you have it. Whether or not sex software poses a bigger threat to the public than it does to the prestige of its authors, I will leave to the reader to decide. I can tell you that despite the limitations of sexual material on computer screens, we can expect more adults-only material on the Macintosh. One publisher of interactive fiction told me he plans to deal with explicit sexual relationships in upcoming programs, using the unfortunate term *Simulatio* to describe his work. Mike Saenz's next effort is what he describes as a tamer, R-rated multimedia product, Sex Vampires of New York. And we haven't heard the last from Chuck Farnham, either. He, too, is planning a CD ROM project, though the tone will be somewhat altered. This new product, to be called Boob, features full-color digitized images of the bare torsos of 15 women. These headless chests are shown while unidentified voices discuss the nature of women's breasts, in the style of a mutant Levi's Dockers commercial.

Does this mean we can expect a battle over salacious software, with media trench warfare reminiscent of the skirmish over record-album labeling? Thankfully, no. I called the dread Parents Musical Resource Council—the Tipper Gore–led mob who forced the recording industry to put warning labels on its products—and I asked them if they considered similar action in the software field. "We haven't given it any thought," said the person who answered the phone.

Which sounds like a pretty good idea. This stuff is best left to little boys to play with, before they grow up and tackle more interesting projects. ■

Steven Levy is a Macworld *columnist and the author of* The Unicorn's Secret: Murder in the Age of Aquarius *(NAL, 1989).*

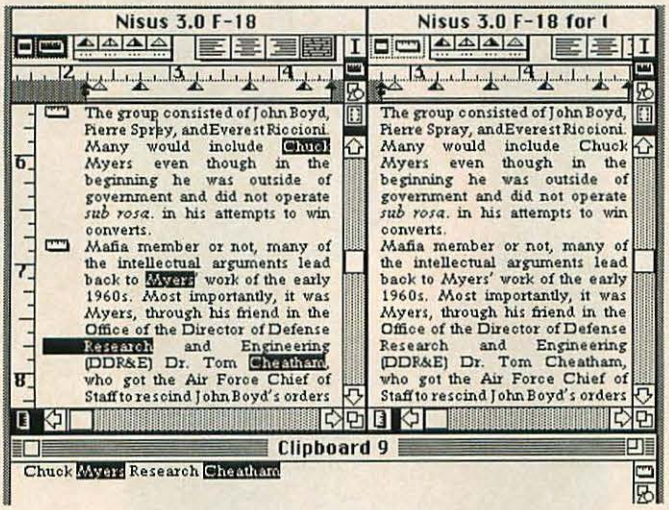
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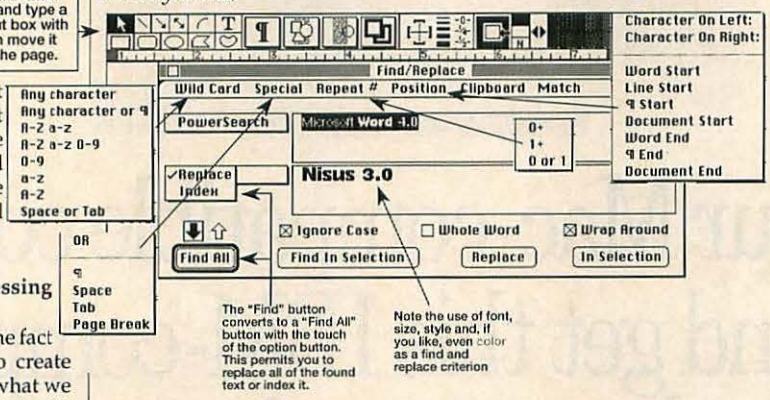
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The automatic file comparison above sent the cursor directly to the first instance where the files differed, which in this case was Sprey versus Spray. Note the noncontiguous text selection works even in any of the 10 editable clipboards. (Note the vertical ruler on the left which allows you to keep track of where you are.)

You can simply click and draw on a transparent layer, either behind or in front of the text, and have the text wrap around the graphic or flow through it. Draw a simple arrow and type a margin call-out box with one click, then move it anywhere on the page.



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For power, consider the fact that Nisus allows you to create custom routines beyond what we have already done for you, with our built-in word processing language. You don't have to use this feature, but it's there if you need it. It is one of the many features that distinguishes Nisus 3.0 from Word 4.0. It will let you, for example, create routines to index every word in a document, while stripping out *and, or, the, but,* and other nonessential words. One user even built a routine to index all proper names. Another user developed a method to find and correct all double words, periods, and extra spaces. The opportunities are unlimited.

Find and Replace virtually anything

Nisus 3.0 will let you find any text, *style*, size, or color in any combination. But even more powerful is its ability to find every word in a document at once even in unopened files. For example, suppose you want to index a book where the subject is Ben Franklin. With Word 4.0, you'd have to open each file, go to each instance of Ben Franklin, and index them one by one. With Nisus 3.0 you simply find all Ben Franklins—even in unopened files—and instead of selecting *replace*, you select *index*. Think of the time savings on a long document.

Noncontiguous text selection

Thoughts don't always come in the order you want. Sometimes you type a nugget here and a valued phrase there. So why should you have to select text as though you were a perfect serial thinker. Nisus 3.0's noncontiguous text selection permits you to collect your thoughts on your random walk through the text and bring them all together on one of 10 editable clipboards.

The table above is a brief summary of some of the features that make Nisus 3.0 the most powerful yet easiest to use word processor. Discover why Nisus is shipped with every Macintosh in Korea, why *MacUser U.K.* named Nisus "1989 Best Word Processor," and why *MacWorld Australia* uses Nisus as its word processor of choice.

Nisus 3.0 and Word 4.0 Feature Comparison	Nisus 3.0	Word 4.0
Built-in word processing language	■	
Noncontiguous text selection	■	
Mix column formats	■	
Find all and replace or index	■	
Find any **font,** *style,* size, or color	■	
Place text or graphic linked to parent text or graphic file	■	
Find and replace in open or unopened files	■	
Cross-reference text	■	
125,000+ user definable key commands	■	
"Super Style sheets" down to character level	■	
Automatic File Comparison	■	
10 editable clipboards	■	
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Built-in Graphics	■	
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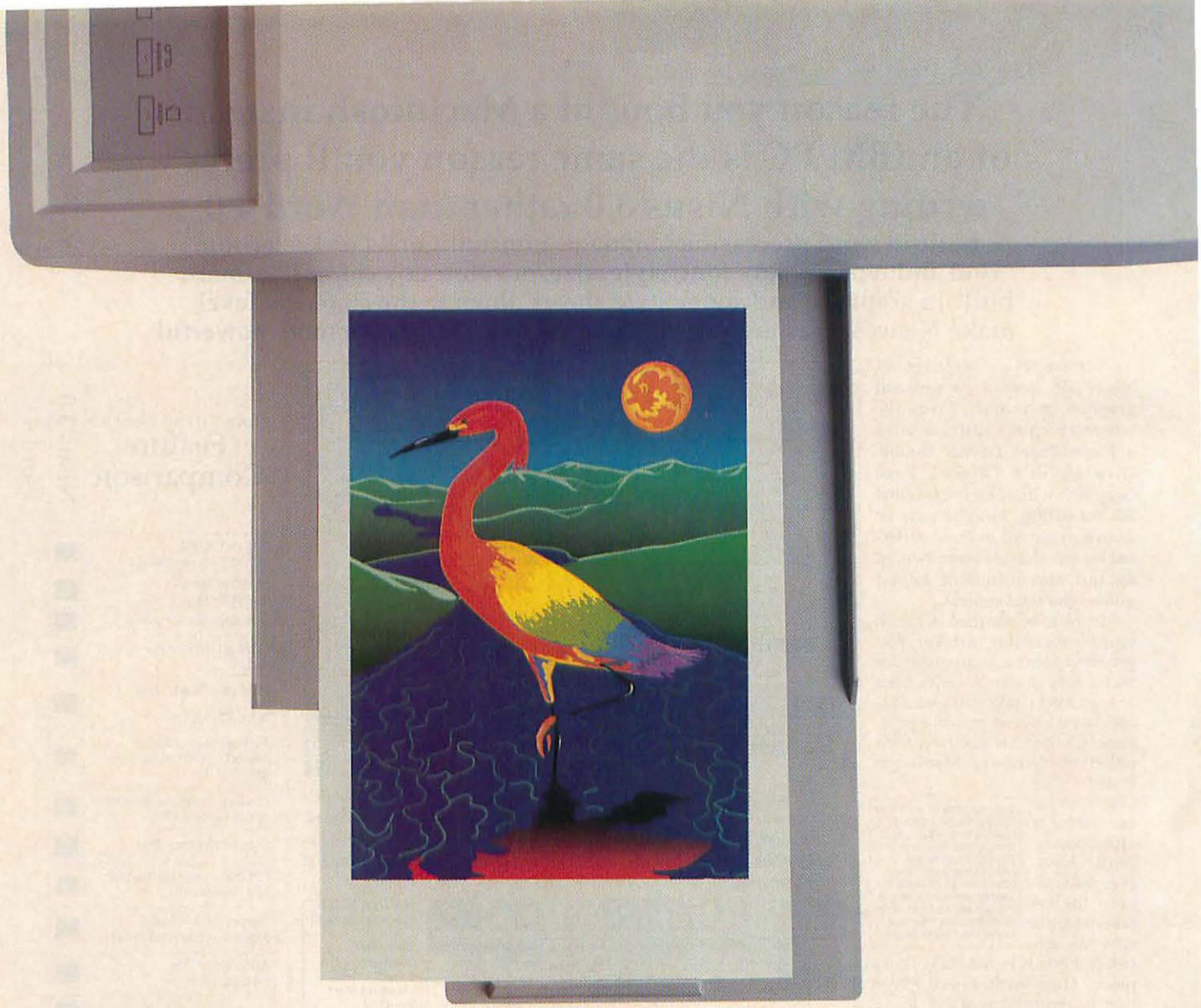
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Circle 357 on reader service card



The ABCs of User Group Finance

IT'S TIME TO CLEAN UP THE BOTTOM LINE

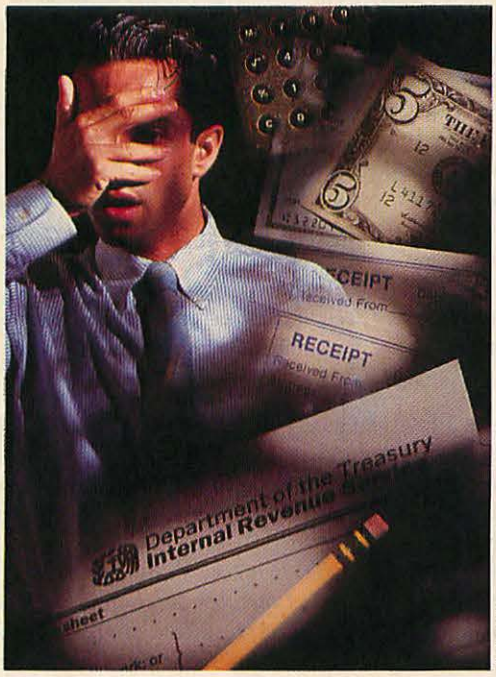
BY DEBORAH BRANSCUM

More and more user groups are discovering the hard way that there's no hope of having a healthy organization if you ignore the bottom line. The Portland Macintosh User Group (PMUG) learned that lesson when it became apparent that $25,000 in group funds were missing. Another example is the Mini'app'les of Minneapolis, which struggled with the IRS over a $6000 fine.

In April, while attending the National Apple User Group Conference (NAUGC), I asked attendees how their organizations handled finances. It turns out that a lot of groups tend to ignore money matters, because they don't know how to manage their finances, or they simply find money matters boring.

Smith, Bucklin is a 40-year-old company in Chicago that specializes in managing nonprofit associations, including Apple's MacIS group. I asked chief financial officer Wesley Christensen what user groups should do to protect their financial assets. Here are some suggestions based on his response, and on advice from user group leaders and from the PMUG Investigation Committee Final Report issued in response to the missing funds.

- Keep *consistent* financial records. Choose a single program and a single accounting system and stick to it (see "A Full Accounting," *Macworld,* November 1989, for recommendations).
- Require two signatures (for example, the president and treasurer) for every check your group writes. Some groups give three officers authority to write checks, just in case one officer becomes unavailable.
- Don't give the treasurer direct and sole control over depositing or disbursing funds. Ideally, says Christensen, any receipts such as user group dues should be directed to a bank's lockbox. The bank will deposit the money and send back a statement listing all receipts.
- Establish a policy stating what the treasurer does and who he or she reports to. The board should enforce its policy and "shouldn't have the idea that there is a peer controlling the treasury," says Christensen. No matter how much experience and commitment a treasurer has, the board needs to oversee the treasurer's role. PMUG's Investigation Committee recommended that the treasurer handle financial management and planning while a CPA's office deal with the day-to-day accounting.
- Publish financial statements at least every quarter. Members should receive regular statements that detail where the money went. And the board should go over the statements carefully.



TOM GIBSON

"Misuse of funds can happen in a lot of ways," Christensen points out. "You can pay the wrong bill, or pay a bill for something not approved by the board." Together with a budget, the statements can measure the group's financial health, before it becomes too sick to recover.

- Build a budget. Lots of groups don't have them; in fact, the Los Angeles Macintosh Group just created one this year. So did the New York Macintosh

(continues)

MANAGEMENT RESOURCES FOR USER GROUPS

Several books and organizations are dedicated to helping nonprofit organizations such as user groups. Most deal with overall management issues; several offer advice on money matters as well. Can't afford to buy? Follow the *Macworld* example and check them out of the library.

PUBLICATIONS *Publication 557: Tax-Exempt Status for Your Organization* is available at no charge from the IRS and answers questions about applying for nonprofit status. You can get it by calling 800/424-3676.

The Facts on File Dictionary of Nonprofit Organization Management is a great reference for anyone new to the language and concepts of management. This 1986 $40 volume is a simple, clear, and useful guide for those new to management. Facts on File, 460 Park Ave. S, New York, NY 10016.

The Management of Nonprofit Organizations, also published in 1986, is a comprehensive textbook on nonprofit management. Especially useful are Chapter 10 on accounting, which gives examples of balance sheets and budget reports, and Chapter 11 on financial management, which examines the process of setting goals and objectives. This book is $50.50 and is available from John Wiley and Sons, 1 Wiley Dr., Somerset, NJ 08875.

The Nonprofit Organization Handbook is an in-depth guide to the administration and financial management of nonprofits. It covers issues such as organization and corporate principles, leadership and control, volunteers, sources of revenue, and public relations. Part Six, on financial management and administration, is an excellent look at accounting procedures and an up-to-date (as of 1988) listing of pertinent tax laws. It is priced at $84.95 and is available from McGraw-Hill, 1221 Avenue of the Americas, New York, NY 10020.

Accounting for Nonprofit Organizations stresses community-service and health organizations, but still provides useful information on the financial management of all types of nonprofit organizations. Subjects covered include fund categories and financial statements, and the book provides a list of authoritative sources. A knowledge of accounting principles would help in understanding this textbook from 1983. Priced at $14.95, the book is available from Kendall/Hunt Publishing Company, 2460 Kerper Blvd., Dubuque, IA 52001.

The Center for Board and Administrator Relations is a publishing company that produces magazines and manuals of management advice for nonprofits. These include the $15 *Board Member Manual* and a $35 collection of job descriptions for officers and committee members. You can reach the center at Box 208, Sioux City, IA 51102; 712/568-2433.

ORGANIZATIONS The Society for Nonprofit Organizations (SNPO) offers a forum for ideas on increasing productivity of nonprofits and their leaders. Its services include expert advice, training programs, and group insurance. SNPO maintains a library of materials for nonprofit organizations. And it publishes *Nonprofit World,* a magazine and a resource center catalog. You can reach the group at 6314 Odana Rd., #1, Madison, WI 53719; 608/274-9777.

The National Center for Nonprofit Boards offers services to nonprofit boards of directors, including a nationwide information center and guidelines for development and training programs for nonprofit boards. It also publishes a series of books and pamphlets on nonprofit governance. The center can be contacted at 1225 19th St. NW, #340, Washington, D.C. 20036; 202/452-6262.

Smith, Bucklin sells services such as newsletters, mailings, financial reports, and legal referrals to technology-oriented groups on a part-time or full-time basis. It has 500 employees and works with 160 organizations, including MacIS. Smith, Bucklin can be reached at 111 E. Wacker Dr., Chicago, IL 60601; 312/644-6610.

—Jonathan Cassell

User Group (NYMUG), after realizing it was running a $250,000 business. But don't make one poor "volunteer" do it alone. A treasurer I spoke with said, "Every year I ask the officers what the budget should be and they tell me to do it. Every year I do the budget and all they look at is the bottom line."

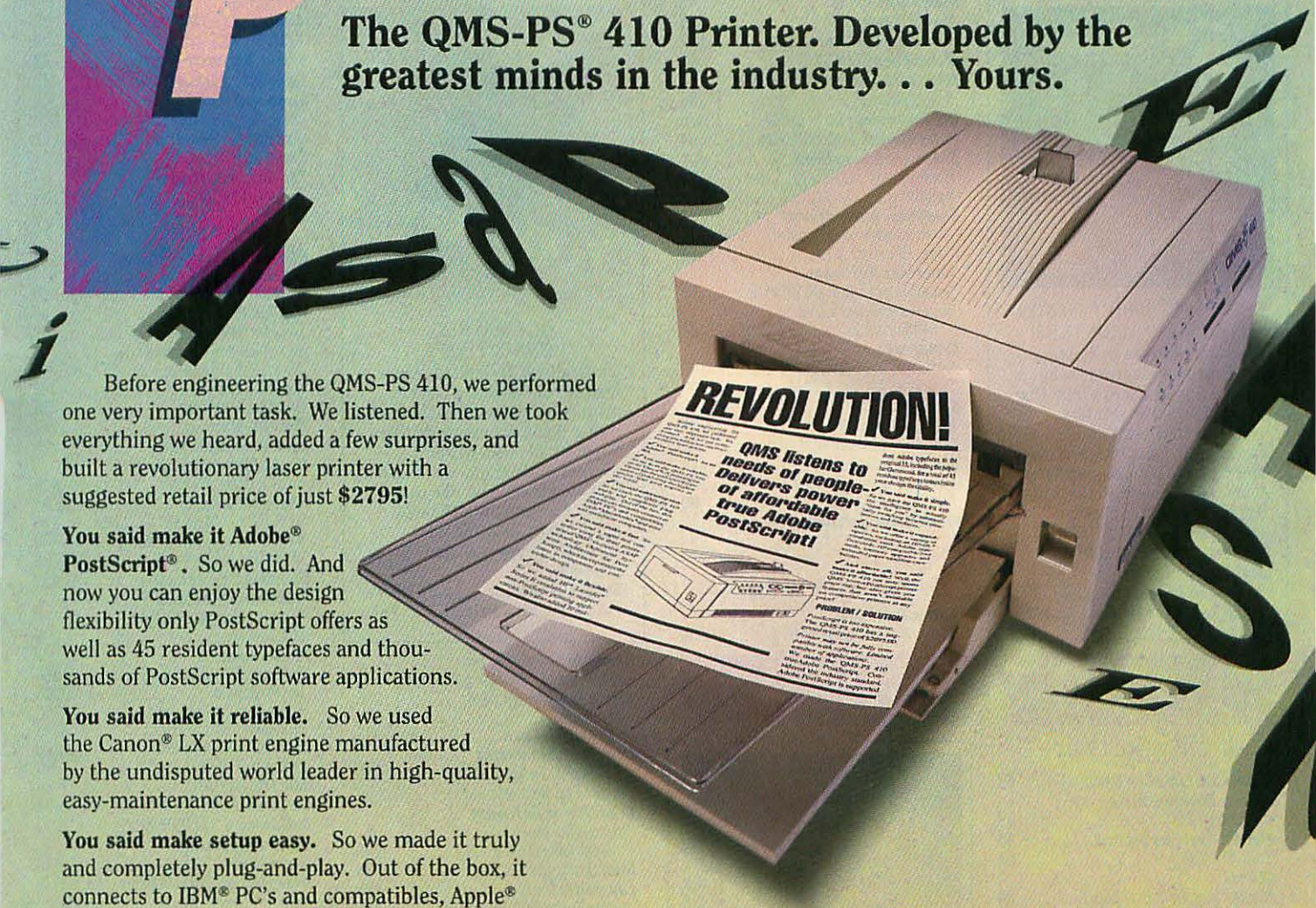
- Conduct an annual audit. Christensen says you should have a professional accounting firm conduct the audit. If that's not possible, your membership may include some accountants or others with financial experience who can make sure everything's under control. PMUG's report recommends an internal audit and a three-to-five-member finance committee with strong accounting and finance skills to provide assistance and guidance to the treasurer as well as to perform reviews of financial activities according to accepted accounting procedures.
- Avoid conflicts of interest. PMUG's board of directors recommends that no person holding an important elected or appointed office in the user group be allowed to sell goods or services to that group for a profit. I would go further and say that rule should apply to *all* officers, "important" or not.
- Mind the law. The Mini'app'les have nonprofit status but didn't file tax returns in a timely fashion. There was no criminal intent, but the result was an 18-month tug-of-war with the IRS, which first fined the group several thousand dollars, then eventually refunded the money. Nonprofit or not, certain laws apply to your group; make sure you know what those laws are. "User groups may be underaware, nationally, of their tax liabilities, and they may not be documenting what they do carefully enough to defend themselves if they are audited," says Boston Computer Society president Tracy Robnett Licklider.

Many user groups seem to worry about balancing fiscal management and fun. "Are we a financial institution designed to succeed? Or is our business to sit on the doorstep and talk Apple to whoever shows up?" asks

(continues)

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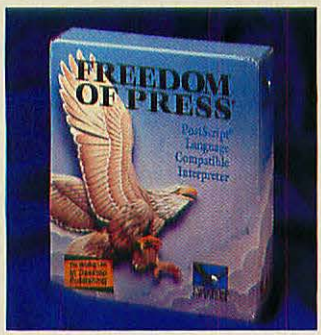
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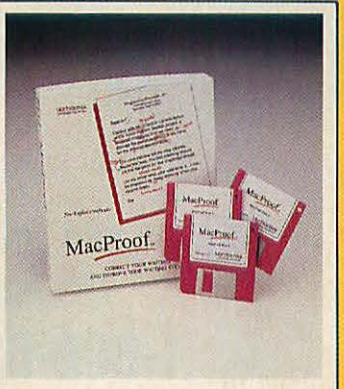
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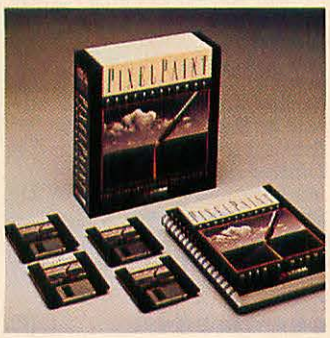
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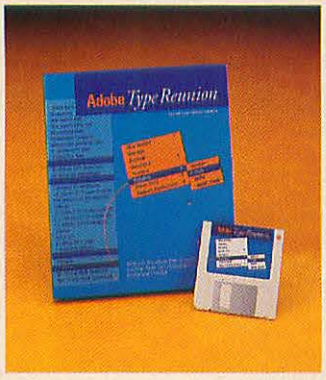
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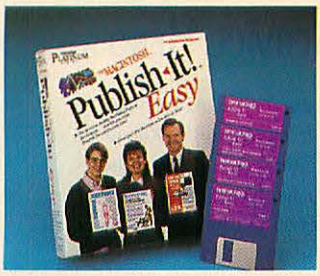
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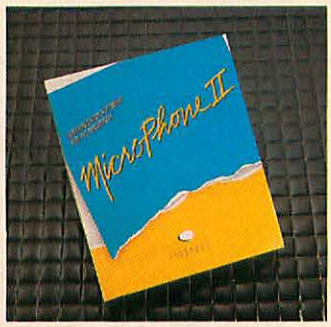
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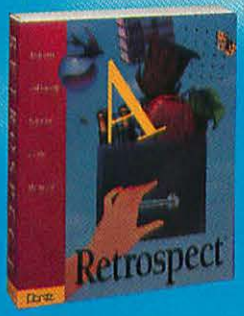
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Daniel Hopper, president of Apple Dayton in Ohio. I understand Hopper's dilemma. But it's really no debate. Legally and morally, officers are responsible for fiscal matters. And a businesslike approach is easier to live with than chaos. As Andy Reese, former president of the Apple Core of Dallas, says, "You can spend the time to do it right initially, or when the IRS comes calling you can hustle and try to figure it out then."

Book Boo-Boo

My apologies to those who called MacBooks (in the June issue) and discovered the phone was disconnected. Try Computer Literacy, a Silicon Valley bookstore chain specializing in computer titles. Order from the San Jose store by calling 408/435-1118.

Help Awards

Apple Professional Exchange (APX) and *Macworld* cosponsored the Help Awards this year, and I asked you to vote for the software company that provided the best support for its products. Many thanks for voting. For the second year in a row, first place went to CE Software. Aldus won second place. And Macreations and Microsoft tied for third. Congrats to all.

Send nominees for sainthood to Service Heroes, *Macworld,* 501 Second St., San Francisco, CA 94107 or via AppleLink (Macworld1) or Connect (Branscum). Conversely, drop Conspicuous Consumer a line if a company is ignoring you.

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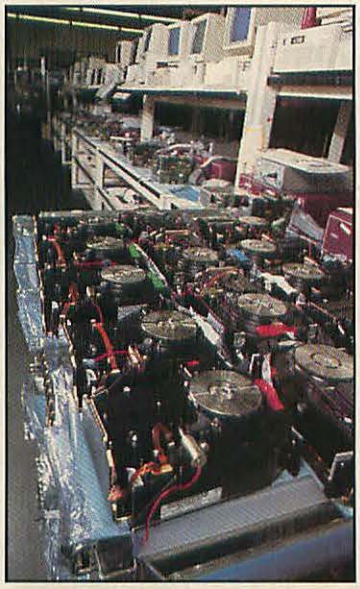
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A Question of Balance

THE MAC OFFERS A STABLE APPROACH TO COMPUTING—FOR NOW

BY BRUCE F. WEBSTER

A certain balance must exist within a computer system, a balance between its various elements and their ability to process and exchange data. Those components include (but certainly aren't limited to) processing power, memory, mass storage, display technology, and software. Any one of these can limit the usefulness of the other components, and therefore that of the entire system. In addition, the overall utility of the system must meet the user's requirements, not to mention the user's budget.

An imbalance occurs when one or more components have speed and/or capacity that is out of proportion to the rest of the system. Consider, as an example, a Mac IIci with 1MB of memory, a single floppy disk drive, and an unaccelerated 32-bit large-screen color display. The system's overall utility is limited by the small amount of memory and storage; it's hard to get much useful work done. Likewise, the 32-bit display is held back by the IIci's CPU and the lack of a graphics coprocessor, not to mention that there isn't enough memory and disk space to hold any significant images.

For six years the Macintosh has suffered from a kind of imbalance. At times it has found a temporary equilibrium, but then the capacity or performance of one component would race ahead, then another, then another. In the original 128K Mac, the software and the display were limited by memory and disk space: applications had to fit on a 400K disk (half of which was eaten up by the system) and had at most about 80K of memory to work with. There have been a few points of balance along the way—like the Apple-saving success of the Mac Plus back in 1986—but new demands by customers have always unbalanced things again. For users, the experience through all this has been like working at a desk whose legs change length independently, forcing repeated adjustment to a new tilt.

Stability for Now

However, a certain stability is now appearing in the Macintosh world. Memory, mass storage, processor power, display technology, and software are all catching up with one another and with a wide range of user requirements. Indeed, it can be argued that the Macintosh is the only platform that currently achieves balance, at least in a way that allows all those components to easily interact with one another. And that could be a key competitive edge for Apple, provided the company has the good sense to take advantage of it.

Apple obviously deserves some credit for achieving this balance. Its two biggest contributions have been flexible system software that adapts automatically to most configurations and an open hardware architecture that pretty much does the same, despite its offering at least four different types of slots. Macintosh users often take for granted the ability to install



multiple video boards in a Mac and have system and application software adjust to the configuration with little effort. Little do they realize the nightmare that could result from an attempt to do the same on just about any other personal computer.

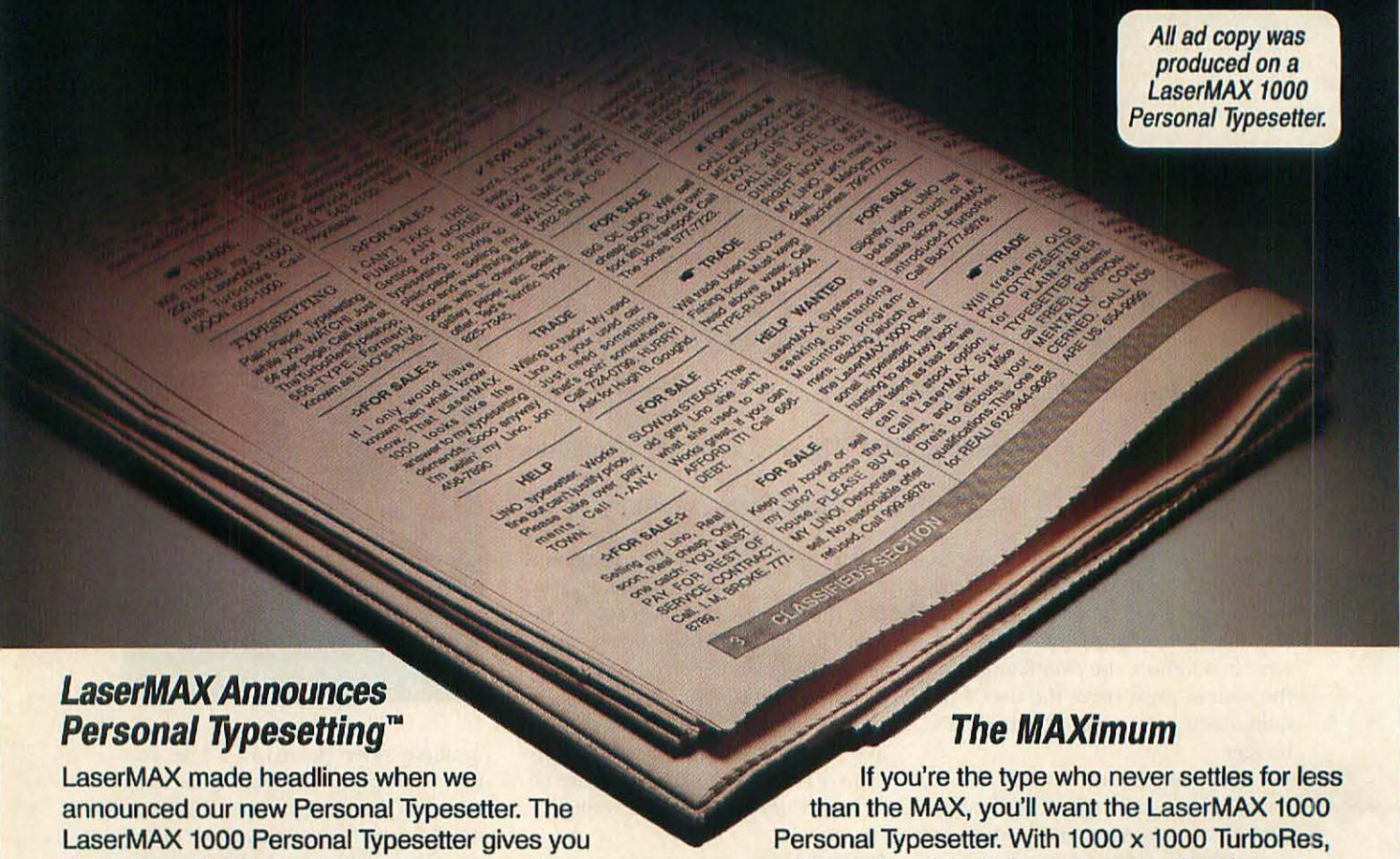
But much of the credit has to go to third-party companies that have taken advantage of the Mac's open architecture and have pioneered technologies and approaches often adopted later by Apple. Third-party companies have helped establish the Mac's balance, with or without Apple's help.

Memory Space

Memory has been one of the most persistent Mac bottlenecks, one essentially created by Apple. Problems have included lack of sockets for memory expansion, system constraints on the address space available to applications, and high prices. Recent price cuts and the release (someday) of System 7.0 will simultaneously introduce virtual memory and remove the current 8MB address-space limit.

(continues)

When LaserMAX Made Headlines Lino Also Made the Paper.



All ad copy was produced on a LaserMAX 1000 Personal Typesetter.

LaserMAX Announces Personal Typesetting™

LaserMAX made headlines when we announced our new Personal Typesetter. The LaserMAX 1000 Personal Typesetter gives you 1000 dpi and 135 typefaces in a package that fits on your desk. Our proprietary TurboRes™ technology lets us control the size of the pixels on the printed page, eliminating the coarse steps between pixels (also known as jaggies.) With TurboRes you create originals that rival phototypesetting–so you won't need to go to Lino anymore. Halftones and graphics also benefit from this technology.

With the LaserMAX 1000 Personal Typesetter you get high quality without high cost.



The MAXimum

If you're the type who never settles for less than the MAX, you'll want the LaserMAX 1000 Personal Typesetter. With 1000 x 1000 TurboRes, you'll need a printer's loupe to prove that the output isn't traditional typesetting. But unlike phototypesetting, the LaserMAX 1000 is:

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- Low-maintenance (no toxic chemicals),
- Very affordable ($7995).

Free Sample Output

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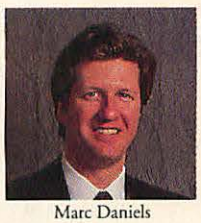
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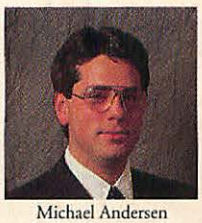
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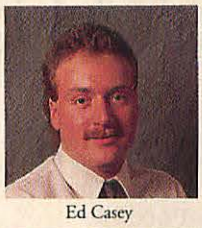
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Michael Andersen


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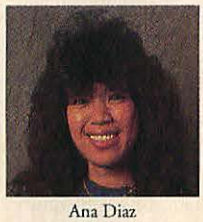

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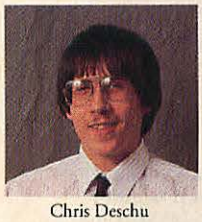

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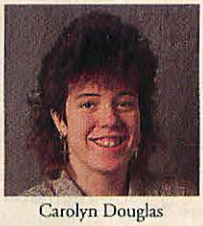

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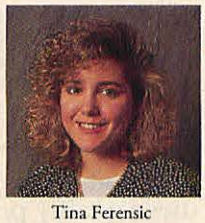

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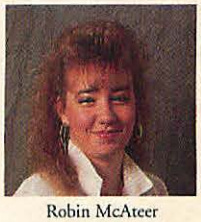

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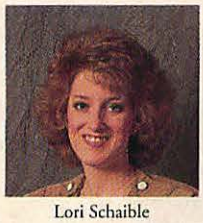

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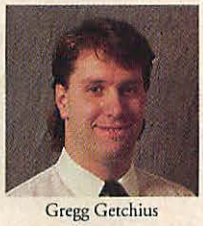

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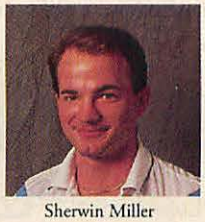

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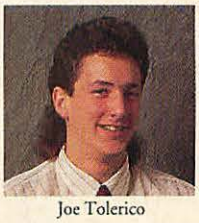

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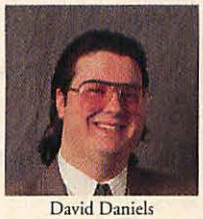

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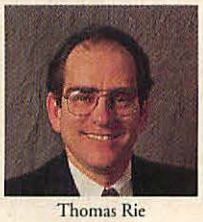

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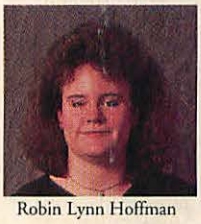

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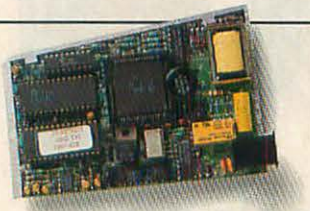
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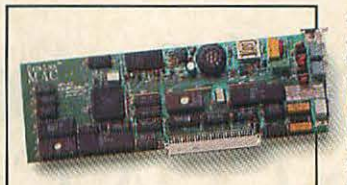
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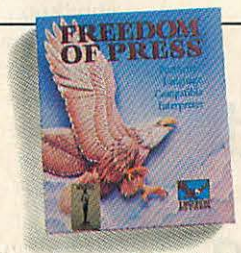
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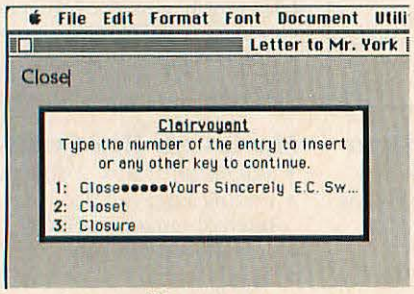
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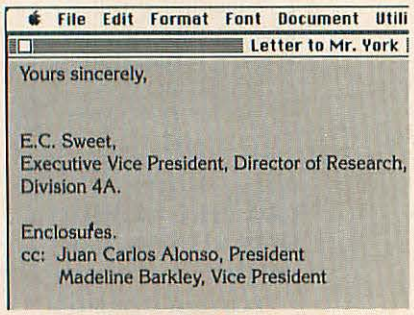
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sorely tax even the Mac IIfx, especially if you're working with 24-bit color. Again, third-party products have come to the rescue—sort of. Levco (619/457-2011) offers the TransLink, a NuBus board that holds up to 4 INMOS transputer chips capable of doing high-speed parallel processing; multiple boards can be installed in a system to achieve even higher degrees of parallelism. However, existing applications cannot take advantage of the TransLink; you need to write your own, using either special MPW tools or the OCCAM language, both available through Levco.

And in an interesting counter to A/UX 2.0, Du Pont (800/545-0847) is selling MacBlitz, a RISC-based NuBus board running UNIX System V and X Windows underneath the Mac user interface. Du Pont claims 14-MIPS performance for the board, which does all the UNIX work, leaving the Mac's CPU to handle the user interface, Mac applications, display, and so on.

Display

The Mac's greatest strength has always been its graphics display. The trend toward accelerated 32-bit color should keep the most demanding users satisfied for quite a while. But even the old 8-bit, nonaccelerated displays beat the heck out of the CGA/EGA/VGA mess in the IBM PC world, in terms of both quality and flexibility.

This is also the Mac area that tends to be most out of balance. As mentioned in previous columns, color images chew up disk and memory space very quickly and place great demands on processor time. And while pixel depth won't move beyond 32 bits for quite a while, other developments—such as high-resolution color scanners and the desktop video products mentioned in last month's column—will force the other system components to catch up.

Software

Macintosh system software (System 6.x) is pretty much in balance with the current hardware line, supporting desired features without consuming lots of resources. System 7.0 will up the ante; Apple has already stated that Macs running System 7.0 will need at least 2MB of memory, and there are serious questions about System 7.0's performance on 68000-based systems such as the Mac Plus and SE. The key question: Will the benefits of System 7.0 (virtual memory, interapplication communications, and other features) outweigh the increased demands upon system memory, mass storage, and processor time?

The Budget Factor

The best-balanced system in the world is of no use if you can't afford it. On the other hand, a sufficiently low price can cover a multitude of sins, as shown by heavy sales of inexpensive MS-DOS systems into offices, schools, and homes. That (and the advent of Windows 3.0) has led to "developer flight,"

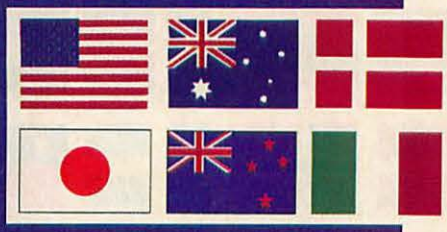
MS-DOS sales cause developer flight, which means fewer, and less excellent, products for Mac users

with more and more Macintosh developers expanding into the MS-DOS marketplace. The potential result: fewer and less-excellent products for those of us who use the Mac, which in turn makes the Mac platform even less competitive.

Declining U.S. sales and unhappy developers have brought about a change in Apple's public stand on Macintosh pricing, with both John Sculley and Michael Spindler conceding the need to build a larger installed base through cheaper systems and smaller margins. If Apple can find a way to offer the power and sophistication of the Macintosh platform at a price competitive with the rest of the PC marketplace, then it will achieve the most important balance of all: long-term growth and survival.

Contributing editor Bruce F. Webster is project manager at San Diego–based LaserGo. He can be reached via BIX (bwebster) and via MCI Mail (Bruce Webster).

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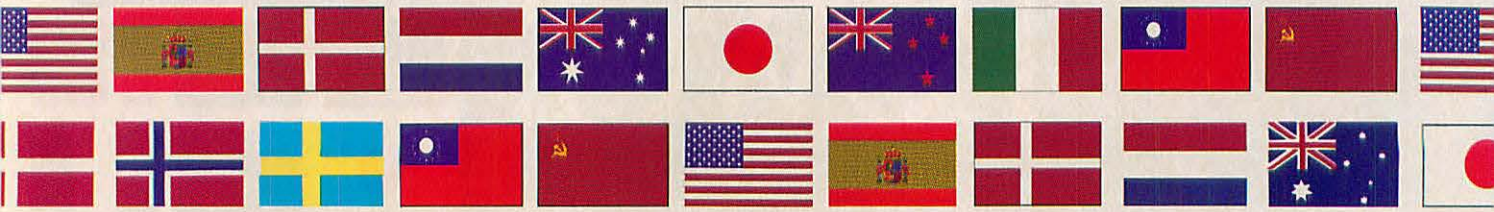
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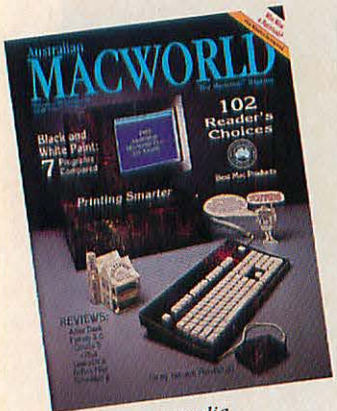
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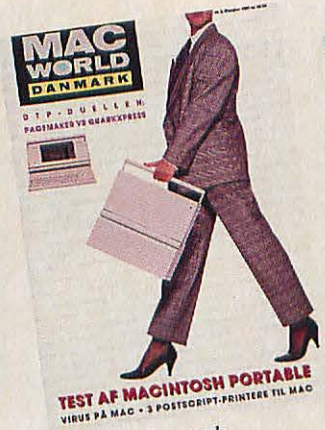
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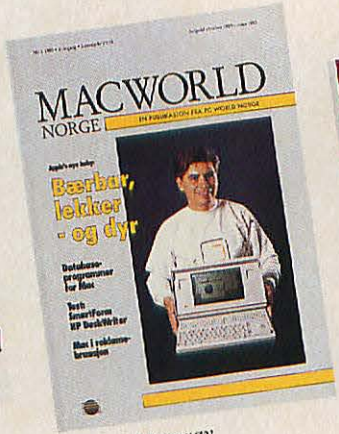




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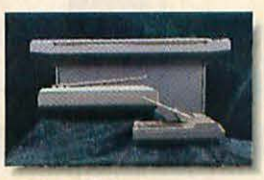
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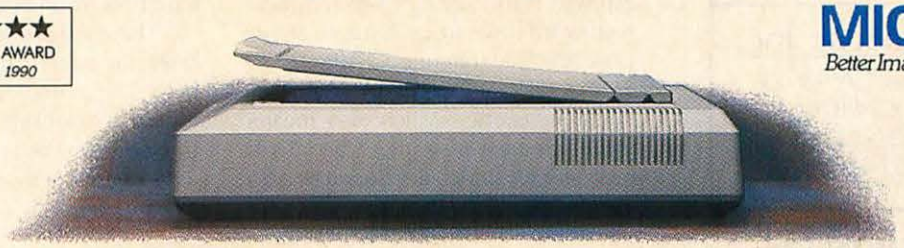


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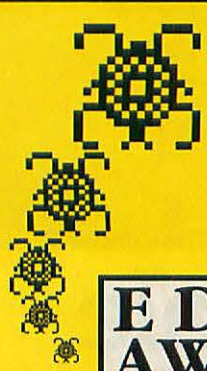
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Again, third-party firms have helped to keep Apple on its toes. Recently pricing for 1MB SIMMs has been as low as $70 each, compared with Apple's list price of $250 (which was reduced from $500 in March). Even the special SIMMs required for the Mac IIfx can be purchased at half of Apple's going rate ($125 versus $250) from some companies.

In the meantime, Connectix (415/324-0727, 800/950-5880) has introduced Maxima, an INIT that lets you make use of any amount of installed RAM. Up to 14MB can be used for applications, while any additional RAM can be used as a pseudo-nonvolatile RAM disk that can (according to Connectix) survive anything but a power loss. Maxima supports the new 4MB SIMMs, as well as NuBus memory boards; it does, however, require a memory-management unit, such as that built into the 68030 processor. Connectix has also released version 2.0 of Virtual, which now also allows up to 14MB of virtual address space.

Mass Storage

And speaking of mass storage, the price barriers that have kept Mac hard disks so much more expensive than their PC counterparts appear to have finally fallen. Prices are dropping, as is access time, and both capacity and transfer rates are going up. For example, FWB (415/474-8055) offers a selection ranging from a $4095 155MB internal (5½-inch) hard disk with a claimed 7-millisecond average seek time, to an external tower capable of holding up to 9 gigabytes of hard disk storage (11ms to 15ms average seek time). The tower can also hold a digital audiotape (DAT) drive, a cartridge tape drive, or a read-write optical disc drive.

Optical drives themselves are making the transition from exotic to commonplace (if high-end) technology, with manufacturers offering 5½-inch systems holding anywhere from 250MB to 1000MB per disc. The newest twist is the $2995 3½-inch optical read-write drive from Pinnacle Micro (714/727-3300) offering 128MB of storage per disk (at $129 each).

More exotic—which also means more expensive—is the SiliconDisk mass storage device developed by Atto Technology (716/688-4259) and also marketed by Peripheral Land as the PLI RAM Drive. This device looks like an external hard drive; it is actually a box with lots and lots of memory (up to 512MB) and a dedicated 68020 processor to control it. Seek time and latency are virtually nonexistent; Atto claims a maximum access time of 50 *microseconds* (that's .05ms) and a sustained transfer rate of 5MB per second. Like I said, it's not cheap: Atto sells its 72MB unit for $32,995 and the 512MB model for $250,000.

Processing

The Macintosh CPU has for years been the major bottleneck in Mac architecture. The Macintosh IIfx has finally begun to address that problem by putting in place I/O processors and direct-memory-access chip support. And, of course, moving from an 8MHz 68000 to a 40MHz 68030, with a similar transition in floating-point processing, has done much to balance system performance.

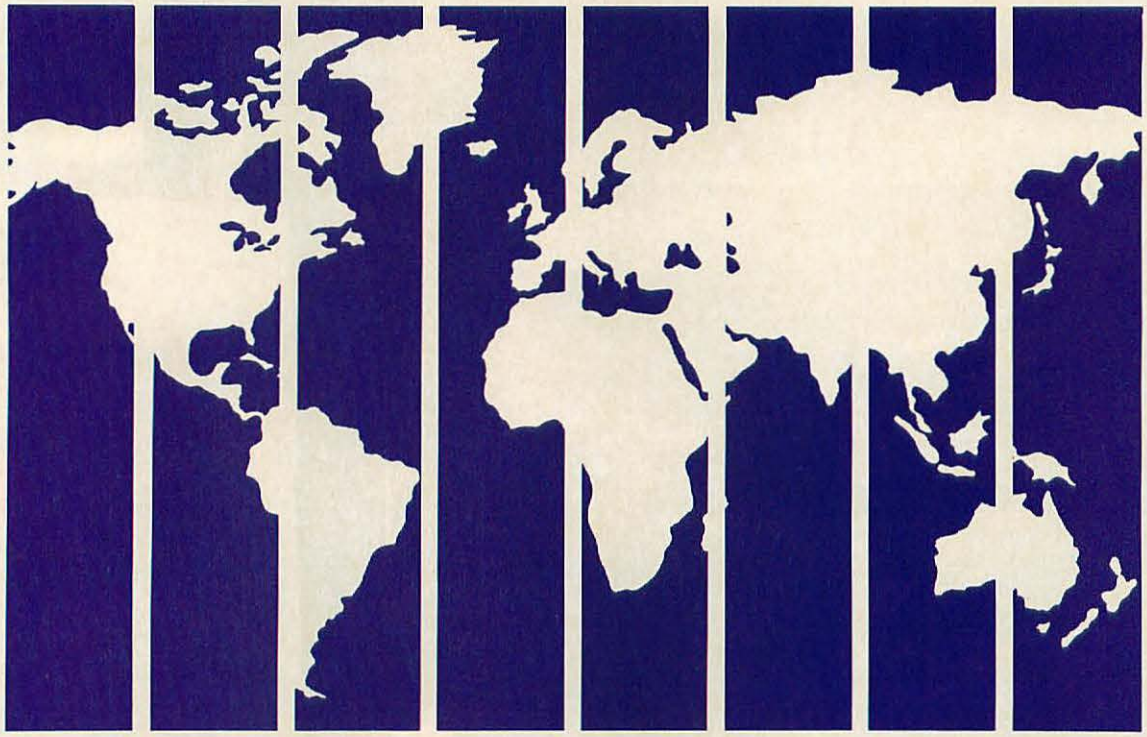
Optical drives are making the transition from exotic to commonplace

But speed and I/O processors aren't always enough. Graphics acceleration, such as that provided by Apple, Radius, SuperMac, and RasterOps boards, helps to offset the burden of working with large color images. Along the same lines, the JPEG color-compression standard is coming rapidly to the Mac marketplace with hardware products from Kodak, Storm Technologies, C-Cube, and others. One could hope to see processors for both acceleration and compression become standard in high-end Macs, much as the floating-point unit is standard now for all but the Mac Plus.

There are also compute-intensive tasks for which the CPU may need help. For example, the Mac is being touted as a platform for CAD/CAM and three-dimensional rendering of graphical images, but those applications can

(continues)

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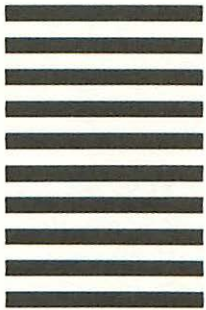
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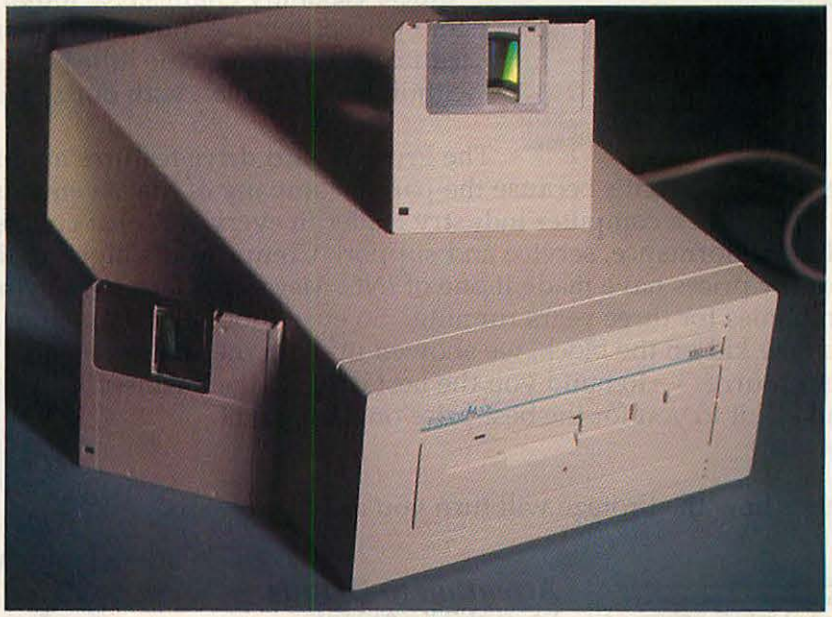
by Dan Littman and Tom Moran

Pinnacle Unveils 3½-Inch Optical Drive

If you are a hard-core portability fan, you may be interested to know that Pinnacle Micro has announced the REO-130, an erasable optical drive that holds up to 133MB of formatted data on discs that measure only 3½ inches in diameter. Because of the shorter radius of the drive, the average time required for the read-write head to move to and access data is about 40ms, less time than the process takes on most 5¼-inch erasable optical drives and well in the ballpark for hard disks, which are typically faster than optical drives.

The 3½-inch drive will use the ANSI X3B11-660 storage format, proposed as an ISO standard. However, users can format the drive for 512 bytes per sector or for 1024 bytes per sector. The ANSI standard is 512 bytes per sector, which requires more formatting information on the disk and reduces the capacity to 126MB. The 1024-bytes format permits the 133MB capacity but is nonstandard.

The REO-130, slated to ship in July, will come in internal and external versions for IBM PCs and compatibles, and in an external version for the Mac. The company is contemplating an internal version for the Mac. Although the discs are 3½ inches in diameter, the size of the complete drive matches that of 5¼-inch drives commonly used in PCs. Pinnacle says it expects to come out with a 3½-inch-form-factor drive in about six months. Meanwhile, the first external Macintosh version will list for $2995. For more information, contact Pinnacle Micro in Irvine, California, at 714/727-3300 or 800/553-7070.— **T.M.**



JENNIFER CHEUNG

Pinnacle Micro's REO-130 takes erasable optical storage into the smaller 3½-inch disc format for the first time. The disc stores up to 133MB of data and will fit into a shirt pocket.

4D's Platform

Integrated software on the Mac is an odd beast. On the low end comes Microsoft Works with a five-pack of stripped-down, haphazardly connected applications; on the high end, Xerox Analyst delivers a vast array of features where the boundaries between applications melt away and the program's Smalltalk heart lies exposed to user modification. Three serious midrange packages have recently appeared (TML Systems' Zebra, Somak's Unity, and Zedcor's Desk), all with various levels of hot links and shared powers.

Now 4th Dimension (4D) publisher ACIUS is proposing another kind of integrated software, one that mimics the minicomputer world, where a database serves as a platform and a resource for all other applications. ACIUS is developing a set of applications to stack on top of 4D that, along with a batch of other tools, will make 4D a self-contained software universe.

The add-on applications include 4D Write, 4D Calc, 4D Draw, and Graph 3D. Any of them can run inside a field in a 4D database, with their own menu bar appearing in miniature in the field. Zoom the field and the add-on application takes over, putting its menu bar across the top of the screen. The add-on applications and 4D share essentially all their capabilities, so that, for example, you can use 4D functions and procedures when inside 4D Calc; embed field names from a 4D database in a 4D Write mail merge document; or design an office in 4D Draw and have the value and quantity of all equipment written out to a 4D inventory database. Or, going the other direction, in a 4D database you can write procedures that use

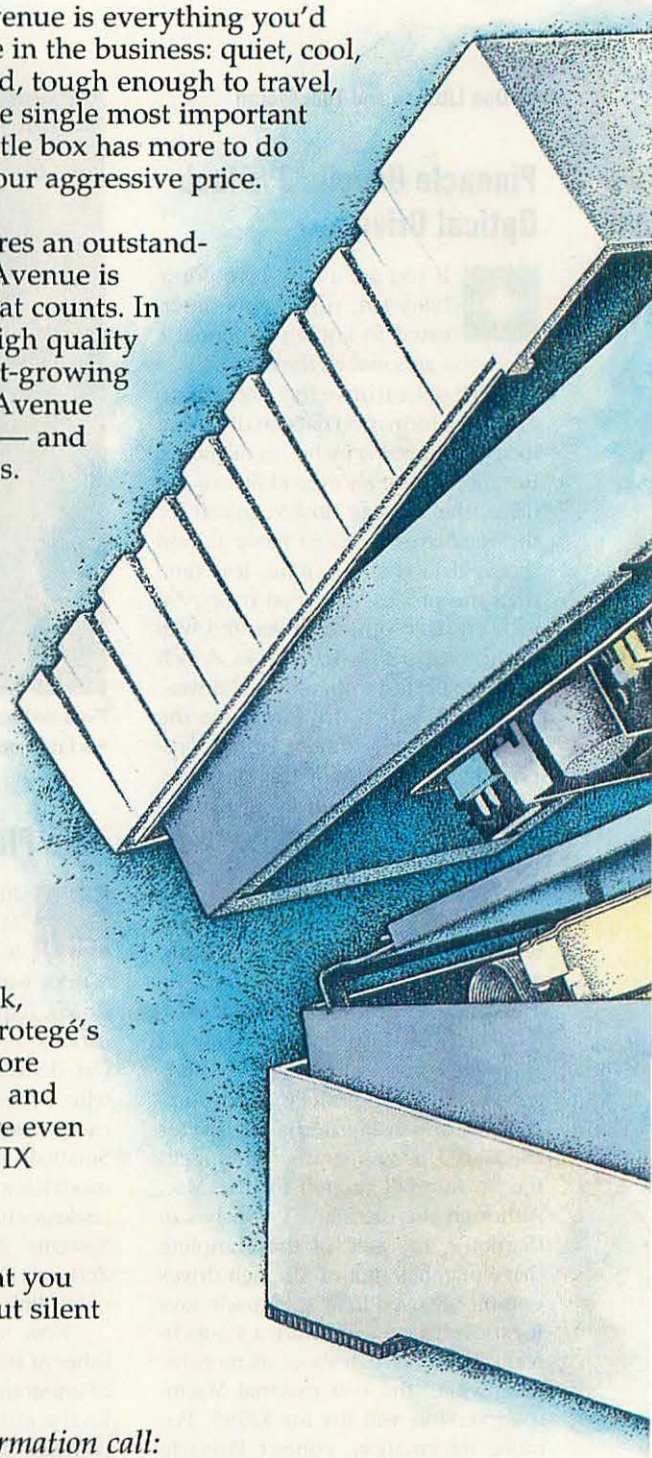
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How The New Kid Made The Best Drive

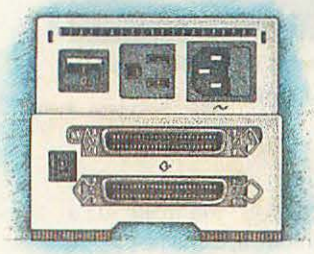


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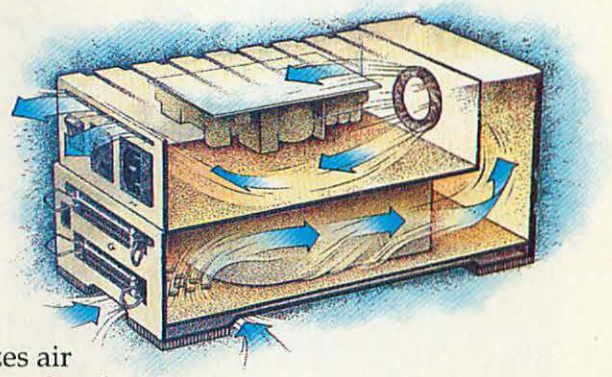
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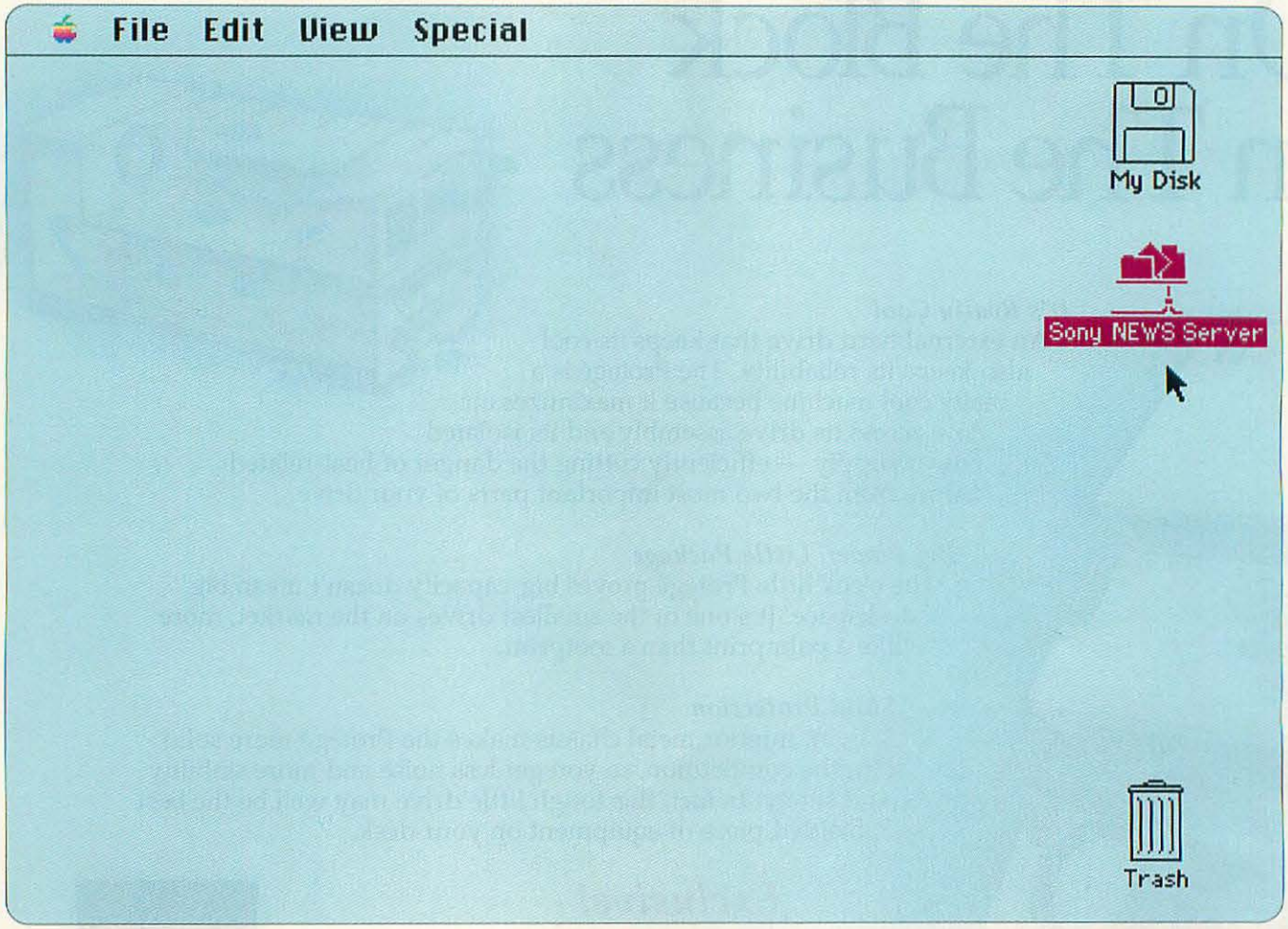
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commands from one of the add-ons—for example, you can ask Graph 3D to generate a graph and pop it into a report. Data from every module can be hot-linked to data in every other module.

The other new ACIUS products include the CL/1-compatible 4D Connectivity Toolkit, which can read tables from different SQL databases and from multiple servers; the Sybase-specific 4D SQL Server for performing all Sybase database-administration tasks from within 4D (4D SQL Server can also convert a 4D database structure into a Sybase database, but it is not actually a server); 4D External Kit; 4D XREF for documenting a database; and 4D Compiler. The compiler can incorporate the engines from the add-on applications to create a double-clickable, custom work environment.

Pricing and licensing fees were not established for all products at press time. By the way, if this all sounds a little daunting, ACIUS recently shipped a $395 relational database called File Force that has much of 4D's capabilities without 4D's custom application–generating environment. For more information, contact ACIUS in Cupertino, California, at 408/252-4444.—**D.L.**



JIM DORRANCE

Programming prodigies: 4D mastermind Laurent Ribardière (right) with childhood buddy and 4D Compiler author David Hemmo.

A Portable Next Machine?

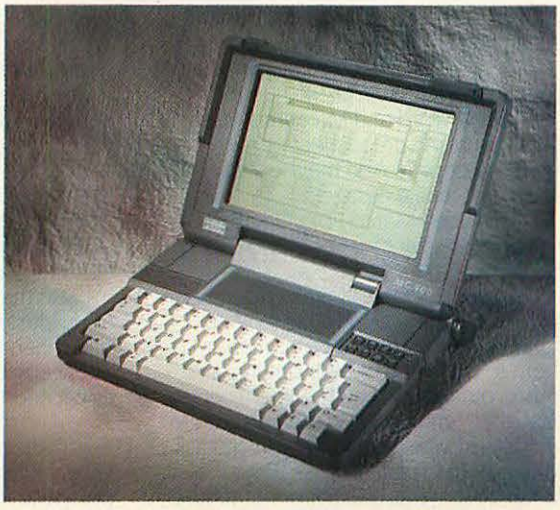
If you are put off by the Macintosh Portable's heft, check out an ultracompact portable with all the elegance of the Next cube. Psion, a leading British manufacturer of hand-held computers, is about to release the first in its Mobile Computer line. The 2-inch-thick notebook-size MC400 weighs about 4½ pounds and has a full-size 640-by-400-pixel screen and a full-size keyboard with full-travel keys, all in a black clamshell case packed with new technology.

The CGA screen uses a retardation film technology, developed in cooperation with Hitachi, and is based on new SMT semiconductors. The MC400 can run for about 60 hours on eight AA batteries, thanks partly to its custom power chip and partly to its lack of moving parts—for example, it uses only solid-state disks (SSDs). The MC400 has four built-in SSD drives called Flash Memory Solid Disks, for which Intel developed the Flash Memory technology and Microsoft designed the Flashlight file system.

The MC400's interface makes comparison with the Macintosh or the Next appropriate. The proprietary multitasking operating system is ROM-based and sports icons, windows, and pull-down menus; a touch pad situated above the keyboard does for a mouse. Like the Next, the MC400 has a voice processing option, which uses a Texas Instruments 32010 digital signal processor. You can digitally record, store, edit, and play back speech—more than an hour's worth in just 300K.

The MC400's built-in software includes a word processor, a free-form database, a configurable personal diary, a calculator, an alarm clock, a terminal emulator, and an object-oriented programming language. It may also include a spreadsheet. A link program will make it possible to save files to an IBM PC or compatible's hard disk, though at first the terminal program will be the only way to exchange files with the Mac. Psion is working on a program that will let the MC400 and the Mac share files directly.

The MC400 will list for about $1600. A modem, fax modem, second serial port, more memory, and voice capability will cost extra. For more information, call Psion in Watertown, Connecticut, at 203/274-7521.
—**Fred Terry**



JOHN GREENLEIGH

The Psion MC400 packs seven applications into a notebook-size shell full of new technology—and it even does windows.

WordPerfect 2.0: Closer to Perfect

WordPerfect's first stab at a Macintosh word processor—with its VAX-like formatting codes and oddball keyboard commands—left disaffected Word users sorely disappointed. But WordPerfect is back in version 2.0 with lots of new features and, best of all, an interface to make would-be FullWrite lovers jump for joy.

For writers who just want to pound away on the keyboard, WordPerfect can feel like a basic text editor. But the new version has an unobtrusive three-layer metaphor with transparent sheets above and below the main document so that the design environment is not a separate mode, as it is in FullWrite. Menus and dialog

(continues)



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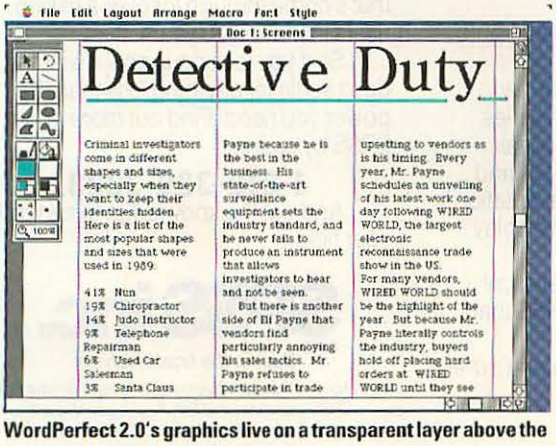
Circle 7 on reader service card

boxes are cleaner than before, submenus tear off, the ruler has pop-up menus for setting most text formatting, and modal dialog boxes are movable.

In WordPerfect 2.0 you can create separate text-boxes that are similar to FullWrite's sidebars but not modal; create graphics using standard paint and draw tools, bezier curves, and a rotate tool; add a wide variety of borders to words, paragraphs, and pages; create mail merges by selecting field names from a dialog box that reads a data document and provides merge commands; create 16-level-deep tables of authority; do 9-level-deep sorts; search and replace by font, size, and style; and execute a macro upon finding something.

WordPerfect's macro feature has a watch-me feature and editable code. A separate manual covers the macro language's approximately 200 commands; and though the language can't generate full-blown applications, it can do some pretty impressive things—for example, WordPerfect's table feature is just a big macro that produces fancy multicolumn formatting.

Missing in action: mathematical typography (Word's math typesetting is about as fun as programming, but for the desperate at least it's there); calculation capability; real outlining (WordPerfect can stack and number text, but you can't move it around). Also, WordPerfect relies on a clunky Font/DA Mover–like tool called Librarian for moving styles, macros, keyboard maps, and so on, from one file to another. Someday someone will create a better way to do this.



WordPerfect 2.0's graphics live on a transparent layer above the text, which simplifies mixing art and text elements.

WordPerfect 2.0 has a list price of $395. For more information, contact WordPerfect in Orem, Utah, at 801/225-5000.—**D.L.**



STEVEN BLOCH

La Cie's Tsunami series of external hard drives (left) stores from 20MB to 210MB. The company's Silverscanner (right) scans in 24-bit color or in 256 shades of gray.

La Cie Launches Hard Disks and a 24-Bit Color Scanner



La Cie recently introduced a $1499.95 color scanner and the Tsunami series of external hard disks with capacities ranging from 20MB to 210MB. The Silverscanner scans images at 24 bits per pixel in color mode, and also offers a 256-gray-scale mode and black-and-white scanning. The device comes with software that controls the scanning window and can create TIFF or PICT files. The $1499.95 price does not include any high-end color-image–manipulation software, which is available from software vendors.

The Tsunami series of 3½-inch hard disks comes with La Cie's Silverlining utility software. Silverlining supports hard disk partitioning, diagnostics, passwords, and other housekeeping functions. The drives all include an external push-button terminator switch, an external SCSI-address-selection switch, an autoswitching universal power supply for overseas use, two SCSI ports, an extra electrical socket, and a fan. La Cie is also providing 90 days of free on-site service through TRW National On-site Service.

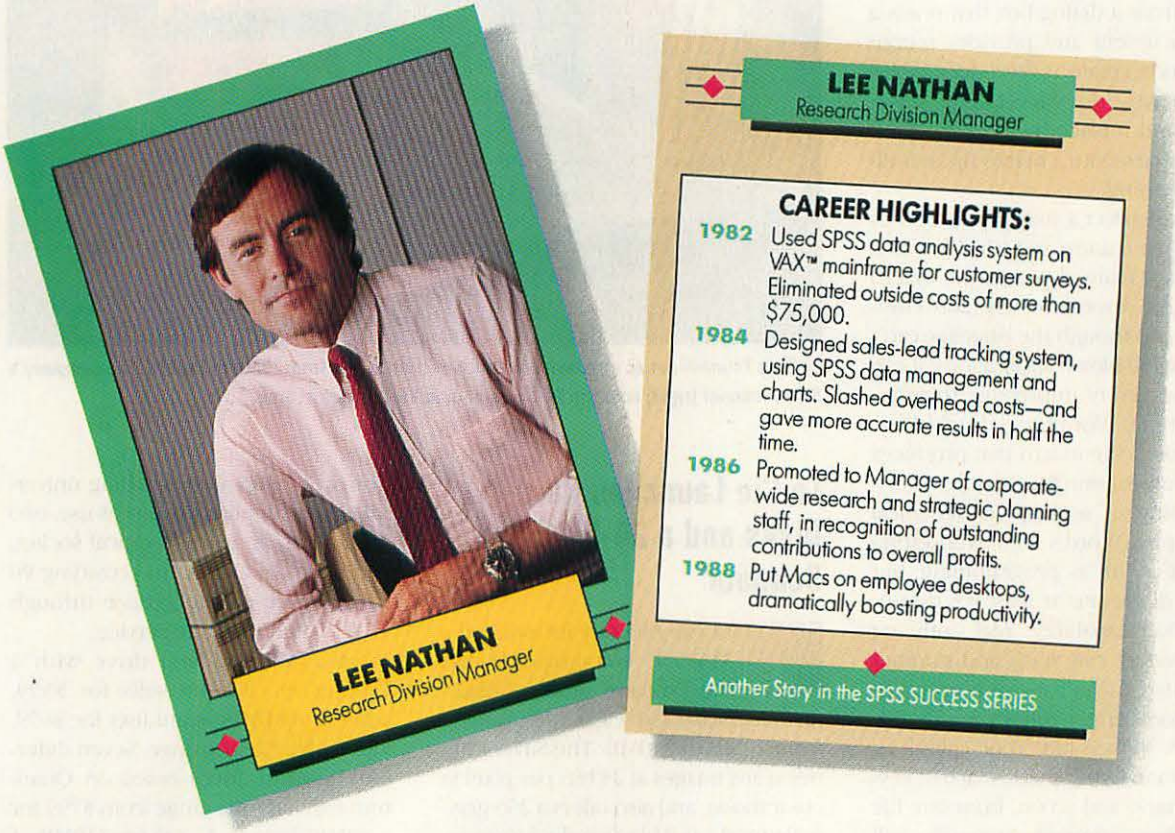
A 20MB Tsunami drive with a Conner mechanism sells for $599, while a 40MB Tsunami lists for $699, also with a Conner drive. Seven different Tsunami drives based on Quantum mechanisms range from $799 for a 40MB drive to $1799 for 210MB. A Tsunami with a 210MB Maxtor mechanism lists for $1999. The Conner drives offer average access times of 25ms, all the Quantum drives have average access times around 19ms, and the Maxtor drive's average access time is around 15ms, according to La Cie. The Quantum drives come with a 5-year warranty.

The Silverscanner and the Tsunami drives are available now, except for the hard disk drives based on Quantum 120MB, 170MB, and 210MB devices, which should ship beginning in July. For more information, contact La Cie in Tigard, Oregon, at 503/684-0143, or at 800/999-0143.—**T. M.**

(continues)

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GWENDOLEN CATES

Chris Settles and the D Zero detector at Fermilab. Settles is using a Mac to monitor instruments for the huge machine.

Nuclear Maccelerator

Scientists at the Fermi National Accelerator Laboratory in Batavia, Illinois, are using the Macintosh to control equipment that will help them in their search for the fundamental particles of matter.

Fermilab is the home of the Tevatron, a ring of powerful magnets 4 miles in circumference that simulates the high-energy conditions of the big bang, a gigantic explosion that scientists theorize was the beginning of the universe. The Tevatron smashes protons and antiprotons together at high energies, scattering them into their constituent pieces and revealing the secrets of their composition. Scientists at Fermilab are now racing to find the top quark, an infinitesimal particle that may hold the key to the structure of matter.

An important tool in this search will be the D Zero detector, a Byzantine two-story-tall mass of cabling and machinery that weighs as much as a World War I battleship. Next year D Zero will be placed inside the accelerator to begin observing collisions.

Technicians at Fermilab are using a Macintosh with National Instruments' LabView 2 to monitor and control the power supplies of the hundreds of crates of electronics that turn the raw data from D Zero's giant sensors into useful information. Chris Settles, a 25-year-old technician at Fermilab, is installing a system that uses a Macintosh IIcx with LabView 2 to send instructions and receive and interpret data from the 75 units that supply power to the crates. A serial connector links the Mac's modem port to a VME bus processing board, which is on a token ring that connects the nodes controlling the power supplies.

With LabView's object-oriented programming environment, Settles is developing *virtual instruments*—software replicas of real measuring devices—that control and monitor equipment with a Macintosh. So far, Settles has developed three complete virtual instruments: one that reads voltage, current, and temperature from power supplies; a second that detects faults that cause power supplies to shut down; and a third that activates, deactivates, and resets power supplies.

Settles says that technicians at Fermilab are now working to interface other equipment to the Macintosh. Fermilab will eventually have up to 40 devices—from smoke detectors to cooling devices—controlled or monitored by virtual instruments.

—Jonathan Cassell

Color PostScript Printers Coming Down in Price

Tektronix and Seiko Instruments USA have both announced printers designed to bring down the cost of color PostScript printing in shared environments. The Tektronix Phaser PX and the Seiko Instruments ColorPoint PS are both thermal wax-transfer printers that offer multiple interface ports for running with a variety of Mac and non-Mac systems and for running over a network.

The Phaser PX includes a serial port, a parallel port, and an AppleTalk interface, and the printer automatically senses incoming data and switches its attention to the appropriate connector. The Tektronix printer comes with 6MB of RAM, but with a $1495 option adds 4MB that allow the printer to receive and spool input from more than one source at a time. The additional RAM also works in the standard ways to speed processing and to hold extra downloadable fonts. The printer runs PostScript version 50.3 and, like the ColorPoint PS, is compatible with HPGL for use with plotters from Hewlett-Packard and other vendors. The Phaser PX uses a 16MHz 68020 microprocessor and prints on letter- or legal-size paper or transparencies. Scheduled to ship in June, the Phaser PX has a suggested retail price of $7995.

Seiko's ColorPoint PS uses a 16MHz Intel 80960 RISC processor to speed printing. The printer uses Phoenix Technologies' PhoenixPage print interpreter, which is designed to be compatible with Adobe PostScript version 50.3. The ColorPoint PS offers automatic switching between its parallel port, serial port, two SCSI ports, and AppleTalk connector, but does not spool from multiple sources simultaneously. However, the Mac version of the SCSI ports isn't expected to be ready until the fourth quarter of 1990. The Seiko printer comes in two versions: Model 4, which prints on A-size paper or transparencies, and Model 14, which prints A-size or B-size (tabloid) output. Model 4 includes *(continues)*



JOHN GREENLEIGH

The Seiko Instruments ColorPoint PS (left) and the Tektronix Phaser PX both produce color PostScript output.

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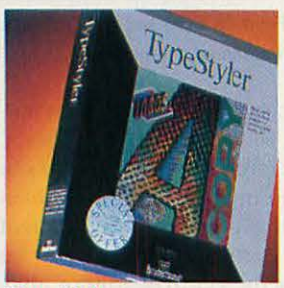
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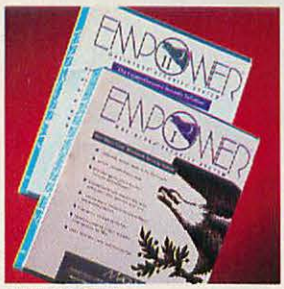
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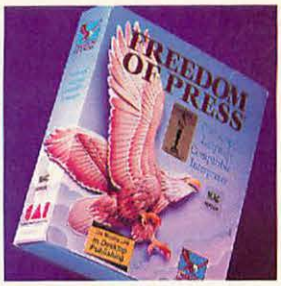
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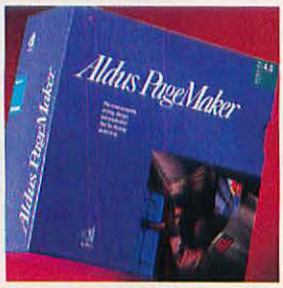
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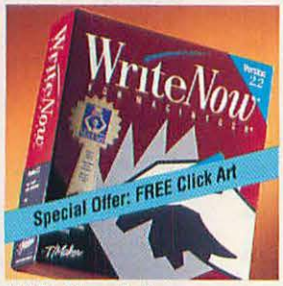
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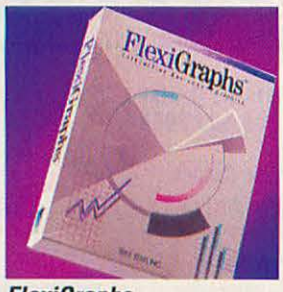
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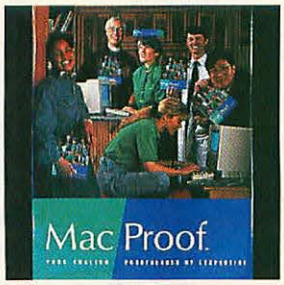
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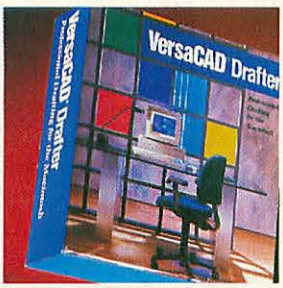
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68030 SE - 25MHz 1,285.
GemKit (allows user to put Gemini 020\030 Accelerators in Mac+, 512kE, 512k, & 128k. Includes internal fan, SCSI port, and space for extra RAM memory) 149.

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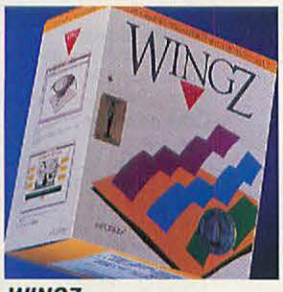
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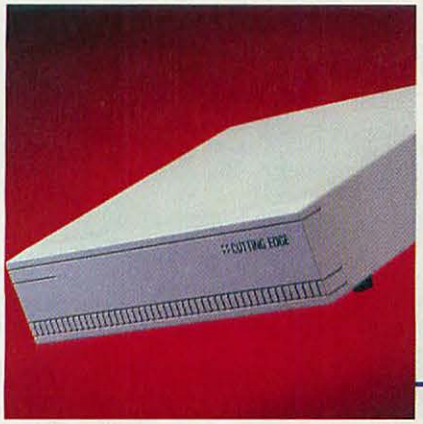
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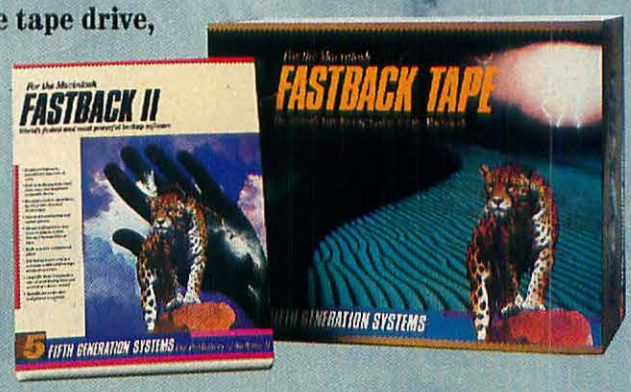
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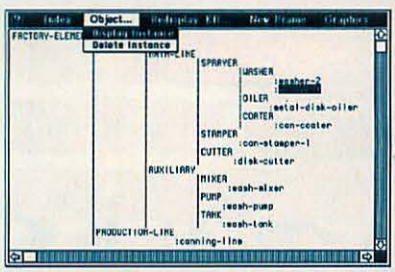
6MB of RAM and lists for $6999, while Model 14 incorporates 10MB and has a list price of $9999. Additional RAM up to 34MB can be added for a price not set at press time. Both models of the ColorPoint PS are expected to ship in August.

Both the Seiko and Tektronix printers use Type 1 and Type 3 fonts and support the Pantone color-matching system. For more information, contact Tektronix in Wilsonville, Oregon, at 800/835-6100, or Seiko Instruments USA in San Jose, California, at 408/922-5800.—**T.M.**

The Expert Mac

Although artificial-intelligence researchers have not produced a computer that even remotely mimics human intelligence, they have created useful tools that are making an impact in business. The most useful tool to find its way from the AI lab into the corporate mainstream is the expert system, but expert-systems development can be expensive: professional hardware and software often start at $50,000.

Albathion Software is challenging the expert-systems market with Entrypaq, an all-HyperTalk shell for building knowledge bases that provides professional features at a rock-bottom price. Albathion cofounders Ed Payne and Robert McArthur—both former



Entrypaq's Knowledge Base Display shows the inheritance relationships between frames (washers) and instances (washer-1).

employees of AI start-up firms, including Gold Hill and IntelliCorp—intend for Entrypaq to accompany their new book, *Developing Expert Systems* (John Wiley & Sons, 1990). The book and Entrypaq together make a first-class introduction to the world of expert systems, in part because, unlike other books on expert systems that rely on obscure LISP or Prolog, *Developing Expert Systems* uses HyperTalk throughout to illustrate the programming principles that lie behind expert systems.

Unlike most Mac systems that sell for less than $5000, Entrypaq incorporates both rules (which describe how to respond to a given situation) and frames (the information about the attributes of whatever is being described). Entrypaq itself is the inference engine, the part that takes the frame and the rules structure and processes them.

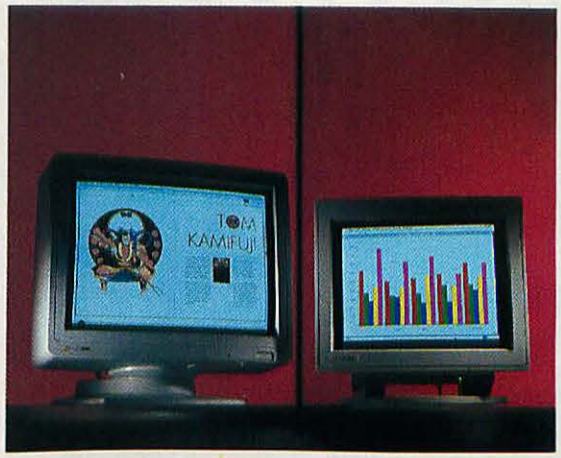
Payne and McArthur developed Entrypaq for several reasons. They are pushing expert systems to become mainstream, commodity items—but want them to be real tools for real situations (not toys like the wine-tasting "expert system" commonly provided as an example with sub-$500 shells). Payne and McArthur see HyperCard as the future of scripting languages, and with Entrypaq's source code entirely in HyperTalk, users can examine how the shell works. Finally, integrating animation, sound, SQL database access, and video into expert systems will be easy under HyperCard.

Entrypaq lists for $79.95 and *Developing Expert Systems* lists for $34.95. For more information, contact Albathion Software in San Francisco at 415/824-2737.—**Dan Rasmus**

Mac and SuperMac

After a 1989 without a single hardware introduction, SuperMac Technology announced three graphics boards, two color monitors, and two monochrome/gray-scale monitors for the Macintosh II series.

The Spectrum/24 PDQ graphics board, listed at $4999, and the Spectrum/8 PDQ, listed at $1899, include SuperMac's second-generation QuickDraw acceleration chip. The chip, built into the boards, delivers 24-bit color at 8-bit speed and 8-bit color at 1-bit speed.



LUIS DELGADO

SuperMac's 21-inch Color Two Page Display (left) and the color 16" Trinitron Display boast 75Hz refresh rates.

SuperMac also announced the $499 Monochrome Card, which supports the two-page display. All the new boards are compatible with monitors from SuperMac, Apple, Radius, and RasterOps, according to SuperMac.

SuperMac's $4799 21-inch Color Two Page Display has a resolution of 1152 by 870 pixels at 77 dots per inch with a refresh rate of 75Hz. The Display is fully compatible with Apple's 4•8, 8•24, and 8•24 GC Macintosh Display Cards. The $1799 21-inch Platinum Two Page Display also has a resolution of 1152 by 870 pixels at 77 dpi with a refresh rate of 75Hz. The gray-scale monitor is fully compatible with SuperMac's Spectrum/8 PDQ and Monochrome boards.

The color 16" Trinitron Display, listing at $2800, has a resolution of 832 by 624 pixels at 72 dpi and a 75Hz refresh rate. The Trinitron Display is compatible with SuperMac's Spectrum/8 PDQ and Spectrum/24 PDQ boards.

The 19-inch Platinum Display, also in monochrome and gray scale, has a resolution of 1024 by 768 pixels at 72 dpi with a refresh rate of 75Hz and a list price of $1399.

All of SuperMac's monitors now include built-in antiglare filters and tilt-and-swivel stands. For more information, contact SuperMac Technology at 408/245-2202.—**Jonathan Cassell**

(continues)

INTRODUCING NEW DISKLOCK

Unbreakable password protection for the Macintosh

It's sad but true. All it takes is a few minutes with your back turned, and an intruder could walk away with your most confidential data. *And you'd never even know it!*

Unsurpassed Password Protection

Now the leader in hard disk security announces the ultimate data protection system for your Macintosh. **DiskLock** works with any SCSI hard disk to provide foolproof password protection for individual files, folders, or your entire hard disk. You can even protect *all three levels* with different passwords for absolute maximum security. **DiskLock** automatically locks your files when you shut down or leave your Mac unattended, and alerts you to any unauthorized access attempts.

Dealers Circle 245 on Reader Service Card

Sophisticated Data Encryption

State-of-the-art data encryption adds yet another layer of security. Without the proper password, your confidential files appear to contain nothing but gobbledygook!

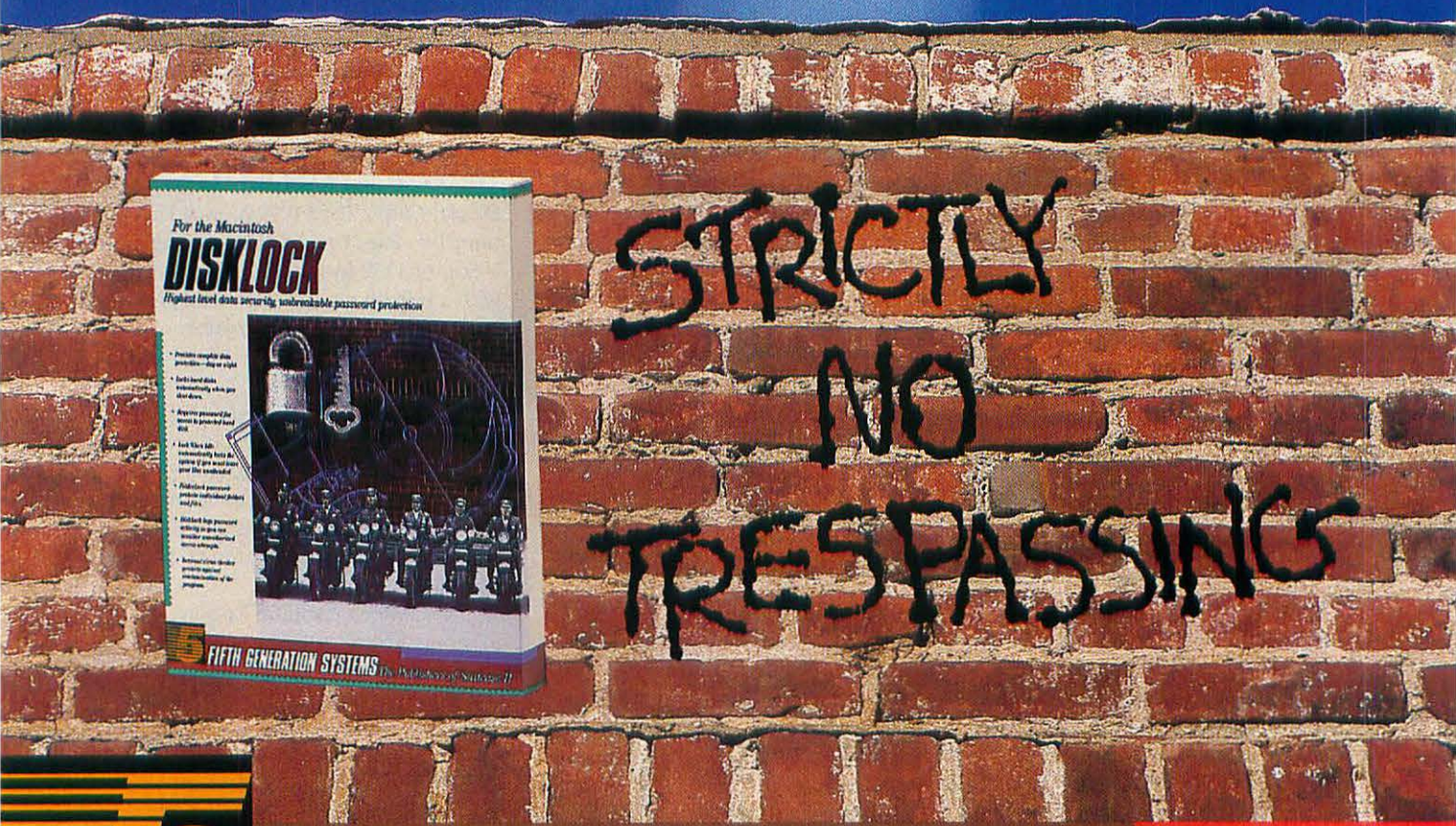
Multiple Security Levels.

DiskLock lets you give each user password access to *just the files you choose* (word processing files for your secretary, accounting files for your bookkeeper, etc.). The *master* password gives you access to all files and folders.

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If **DiskLock's** automatic virus checker detects an infection when you log in to a file, it notifies you and stops running immediately.

End Users Circle 247 on Reader Service Card



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JON GILBERT FOX

Robert Gross's Gene Construction Kit will help investigators figure out how genetic material is constructed and how to redesign it to create new forms of life.

Genetic Engineering on the Mac

Recent advances in DNA enzyme technology have made it possible to determine DNA sequences (the arrangement of the nucleotide bases adenine, guanine, thymine, and cytosine) faster than ever before, and with smaller amounts of material. In a recent spectacular example, scientists were able to sequence DNA from a 20-million-year-old fossil magnolia tree and compare it to current tree species.

This new technology makes it possible to determine sequences at a dizzying rate. Constructing gene maps from sequences to show the arrangement of DNA strands in a gene, the most useful overview of genetic information, requires a method that's faster than pencil and paper and easier than workstation mapping software. A new program called Gene Construction Kit (GCK) may make the Mac the premier gene-mapping workstation.

GCK lets researchers input and organize sequence data from their own labs or from a genetic data bank to produce maps that show relative locations of genetically important sites along a DNA string or chromosome, as well as redesign genetic material. Typically, a lab has a partial map showing a few gene markers. GCK helps integrate new data into partial maps, plan new mapping strategies (it contains a database of DNA-manipulation enzymes and routines to predict fragment patterns in gel electrophoresis), and prepare mapping data for publication. Because the program's author, Robert Gross of Dartmouth College, is an old hand at Mac programming (he wrote an earlier program called DNA Inspector), on complicated screen redraws and block editing GCK clips along at a rate that puts most business applications to shame. It's a remarkable combination of easy-to-use interface and better-than-workstation throughput, at least on a Mac II or higher.

Gene Construction Kit costs $795, or $395 for academic sites. Site licensing is available. For more information, call Textco in West Lebanon, New Hampshire, at 603/643-1471.

—Charles Seiter

MicroSpeed's Ergonomic Trackball

MicroSpeed has begun shipping MacTrac, an ergonomic trackball with a sloped wrist-rest and three buttons. The buttons on the right and left of the ball are larger than those on most trackballs, to accommodate different-size hands and to allow different hand positions. These two buttons wrap most of the way around the ball and work the same as the button on the Mac mouse.

A smaller button is located above the ball and between the large buttons. This third button adds a function present on a number of multiple-button trackballs. Pressing and releasing the smaller button the first time is the same as clicking and holding down the mouse button. You then turn the ball to drag an object and press the small button again to release the object, saving the strain of pressing the button while moving the trackball.

The MacTrac also has a retaining collar that prevents the tracking ball from falling out when jostled. The collar seems to make it necessary to use slightly more pressure to turn the Mac-

(continues)



JOHN GREENLEIGH

The MacTrac trackball has a sloped wrist-rest and three buttons. The middle button helps with clicking and dragging.

FONT-LOOSE

& fancy-free



Bauhaus Heavy ITC Kabel Ultra Futura Extra Black
chen Revue Franklin Gothic Condensed Bodoni Poster
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Bookman Light Linotype Centennial **Belwe Bold**
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Kabel Helvetica Condensed Eras Light *Freestyle*
enir *Futura Light* Bauhaus
Memphis Univers 47 Serifa Sonata
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IGNOT LIGHT

What good are all those Fonts and Desk Accessories if using them is a hassle? **Suitcase II** sets you free!

Suitcase II is the award-winning software that gives you unlimited access to *all* your fonts and desk accessories, all the time. Without having to use Font/DA Mover to install and deinstall them. Without cluttering up your system file. Without anything to stand between you and your creativity.

Imagine being able to view an unlimited number of fonts *in their own typefaces* at any moment, picking and choosing among them without breaking stride. Imagine never having to search through a cluttered System File to find what you need.

Imagine never having to deal with font ID conflicts, never having to restart your system to install a Desk Accessory you need. Imagine spending your time *creating* instead of juggling fonts and DAs.

Imagine **Suitcase II** on *your* Macintosh...



FIFTH GENERATION SYSTEMS

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Circle 364 on reader service card

Trac than to turn other trackballs.

MacTrac comes in two versions; one with an ADB connector for the Macintosh SE and later models, the other with a DB9 connector for the Plus and earlier Macs. The ADB version has a suggested retail price of $119, and the DB9 version's suggested retail price is $99. For more information, call MicroSpeed in Fremont, California, at 800/232-7888, or 415/490-1403 in California or outside the United States.—**T.M.**

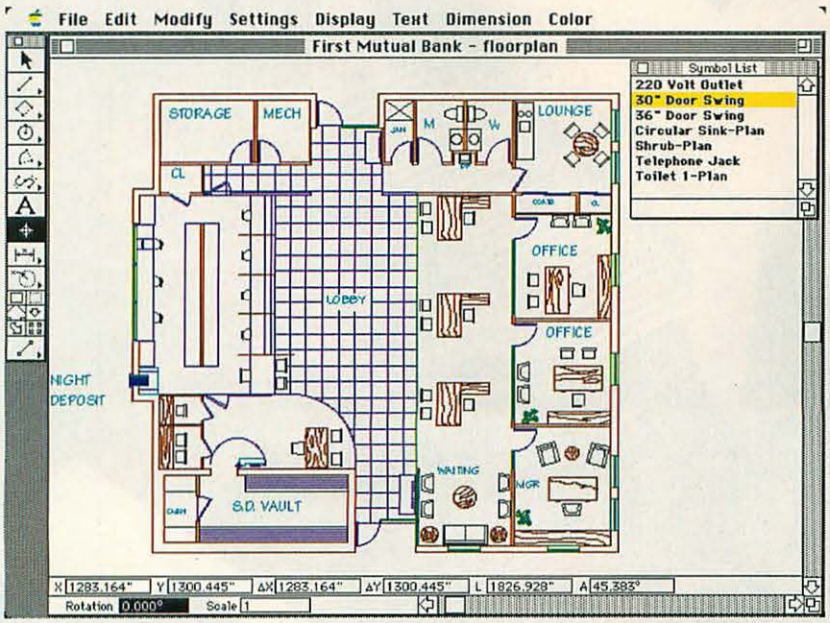
Generic Leapfrogs to Level 3

Generic is bypassing its DOS Level 2 CADD product with a new 2-D CADD product for the Mac that matches features with the DOS Level 3. The new Mac product will be called Generic CADD, and will have a much-improved interface—for example, it replaces vector text with Mac fonts and adds basics like scroll bars and floating tool palettes.

Drawing in Generic CADD uses two complete clicks instead of a click-and-drag, making it possible to select a tool, stop in the middle of drawing an object, and adjust the object's attributes. Tools are context-sensitive: when you choose the rectangle tool, you get a set of options to make the rectangle square, rotate it, and so on. A parameter box lets you create new objects and key in all their attributes without using the mouse; another box provides suggestions for appropriate next actions.

Fills and hatches, as well as dimension lines, adjust automatically when object boundaries change. You dimension by selecting an object with the dimension tool and dragging the pointer away; the dimension line appears automatically. You can dimension groups of objects (and set arrowheads on dimension lines) in batches, or you can dimension from the edge of one object to the center of another, and so on.

Generic plans to maintain its $149.95 CADD Level 1 and to improve the new product's interface. Generic CADD opens Level 1 files directly and has DXF translators and batch-mode DOS-to-Mac translators. It will list for $595. For more information, contact Generic in Bothell, Washington, at 206/487-2233.—**D.L.**



Adding a swinging door to a floor plan from Generic CADD Level 3's integrated object library. Data can be entered directly into the parameter boxes along the bottom.



STEVEN BLOCH

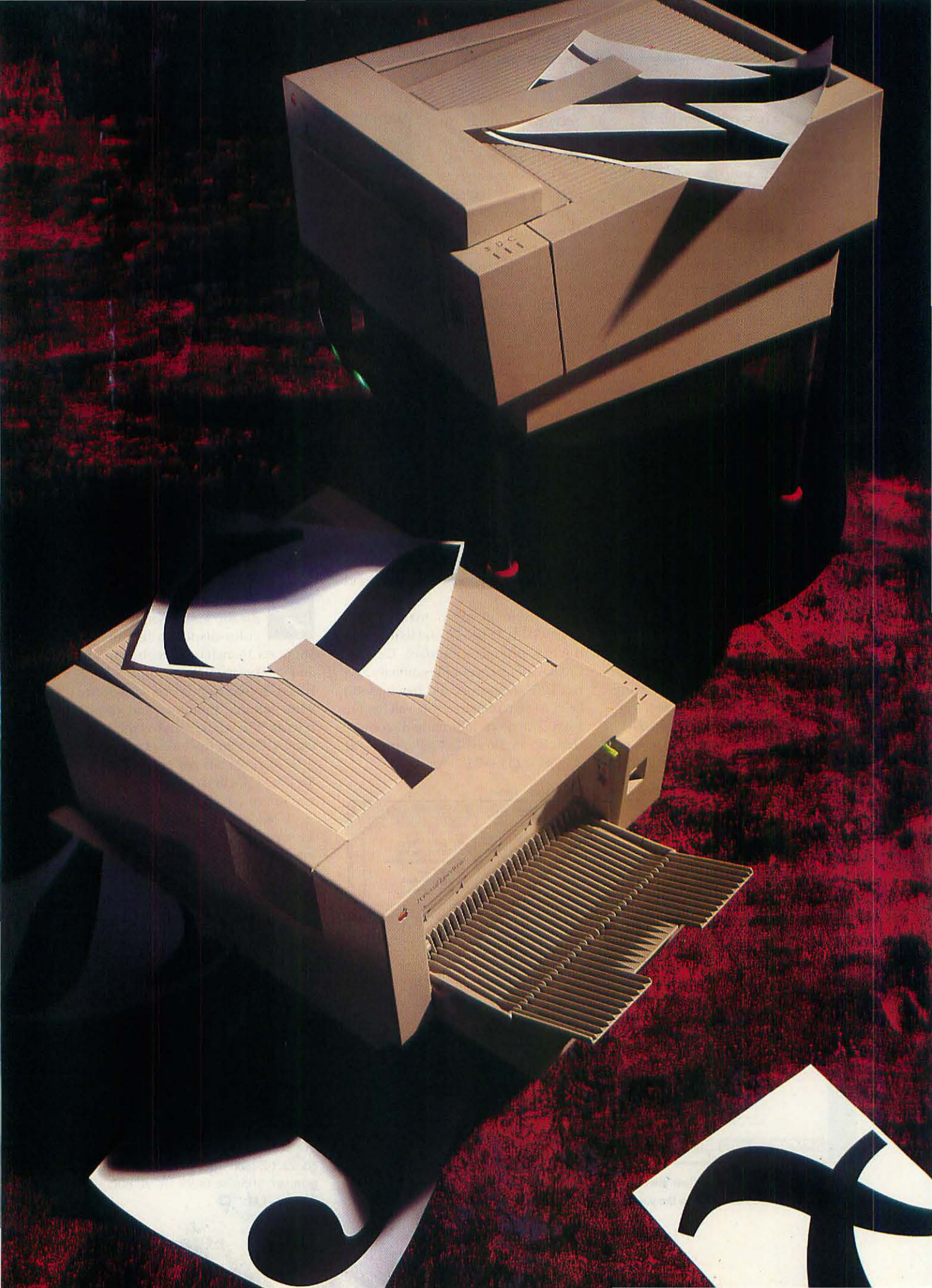
E-Machines' 16-inch TX color monitor works with the E-Machines /24, a 24-bit color adapter board for CAD and DTP.

24-Bit Color Board for 19-Inch Screens Works with Apple Accelerator

E-Machines has introduced for the Mac II series a 24-bit color-display adapter that supports 16-inch or 19-inch monitors and can be sped up by Apple's RISC-based accelerator board in systems with multiple monitors and display boards. The adapter, called the E-Machines /24, can drive displays at 1, 2, 4, 8, 16, or 24 bits per pixel. Intended for CAD/CAM and desktop publishing applications, it retails for $3195.

E-Machines is selling the controller separately, or with two of its existing monitors. The T19, a 19-inch Sony Trinitron display with a 72Hz refresh rate and 76-dpi resolution, lists for $4195. E-Machines sells the adapter and display together under the name T19/24 for $7390.

The other display is the 16-inch TX, also a Sony tube with a 72Hz refresh rate and 87-dpi resolution. When sold with the 24-bit adapter, the two products are called the TX/24. The TX/24 bundle retails for $5890. Both E-Machines monitors display 1024 by 808 pixels and are also compatible with 8-bit graphics adapters. All three products are available now, according to the company. For more information, contact E-Machines in Beaverton, Oregon, at 503/646-6699 or at 800/344-7274.—**T.M.**



by Jim Heid

LaserWriters for Less

The Personal LaserWriter duo offers laser quality at a lower price

Once you see what a laser printer can do, you don't want to settle for less. Once you learn what a laser printer costs, you realize you may have to. A laser printer complements a Mac's graphics and typographic features beautifully, but many people can't justify spending more for a printer than they did for the Mac.

Apple's new Personal LaserWriters were designed for home and small-business users who want that laser look but who can't break (or rob) the bank to get it. The Personal LaserWriter SC and the Personal LaserWriter NT will retail for approximately $2000 and $3300, respectively (final prices weren't available at press time). Admittedly, these prices aren't as personal as many people would like, but they're significantly lower than the cost of Apple's other LaserWriters—the $4999 IINT and $6999 IINTX. What's more, the Personal LaserWriters compare favorably with printers in their own price range; indeed, they boast some features you won't find on Apple's costlier scribes.

But the Personal LaserWriters aren't the only quasi-affordable laser printers available. After looking at the Personal LaserWriters themselves, we'll take a look at where these new players fit into the larger spectrum of low-cost, medium-resolution printers. The following preview is based on a press briefing conducted at Apple headquarters.

Family Resemblances

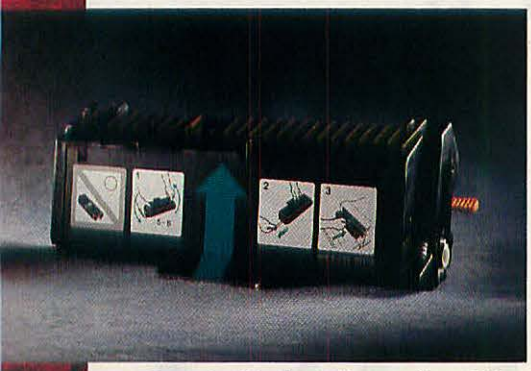
If you've been waiting for a LaserWriter that prints more than 300 dots per inch or one that uses the PostScript-clone software, TrueImage, that Apple licensed from Microsoft last year, you'll be disappointed. The Personal LaserWriters are evolutionary, not revolutionary. Both have many features in common with their similarly named cousins in Apple's LaserWriter II line.

- The Personal LaserWriter SC (SC for short) is conceptually similar to the LaserWriter IISC (IISC), which is now discontinued. Like the IISC, the SC's driving language is Apple's QuickDraw, not the PostScript page-description language most other Mac laser printers use. As a result, the SC has some limitations that make it a second-best choice for desktop publishing and many graphics applications. The SC attaches to the Mac via the SCSI connector (hence the printer's name), so it can't be shared with other machines on a network. It's truly a personal printer.
- The Personal LaserWriter NT (NT) has much in common with the LaserWriter IINT and IINTX (IINT and IINTX), both of which are still on the market. The NT relies on Adobe Systems' PostScript, so it's a natural for PostScript-based desktop publishing and graphics-intensive tasks. The NT also provides an AppleTalk connector that allows the printer to be shared on a network by Macs and LocalTalk-equipped IBM PC compatibles.

Like the LaserWriter II family, the Personal LaserWriters employ a modular design. Each printer's controller—the brains that govern the photocopier-like print engine—resides entirely on one circuit board that's easy to remove and replace. While upgrading an SC to an NT is as simple as exchanging one board for another, the pricing for the upgrade had not yet been set at press time and could prove to be prohibitive for many budgets.

Sizing Up the Print Engine

Not only do Personal LaserWriters cost less than LaserWriter IIs, they weigh less and require less space. A Personal LaserWriter weighs 32 pounds, 14 pounds less than a LaserWriter II, and



Toner cartridge for the Personal LaserWriter SC and NT

it's 20 inches wide, 5 inches narrower than the LaserWriter II. Better still, a Personal LaserWriter's case is designed so you can banish the printer to a corner, flush against the walls. Indeed, only the front of the printer, which holds the paper tray, needs breathing space. By comparison, the LaserWriter IIs require between 8 and 15 inches around each side for ventilation.

The Personal LaserWriters' delicate footprints are made possible by the compact Canon P-110 print engine used in both machines. It's the same engine used in Hewlett-Packard's popular LaserJet IIP. Like the Canon LBP-SX engine in the LaserWriter IIs, the P-110 is fueled by a slide-in disposable cartridge containing the imaging drum and toner supply. The cartridge itself is somewhat different from the one used by an SX engine (the P-110's cartridge lasts for roughly 3500 pages instead of 4000, for instance), but it's just as easy to install.

The P-110 engine has a rated life of 150,000 pages, after which you might want to have it overhauled. That's half the life expectancy of a LaserWriter II, but the difference is hardly worth losing sleep over. You'd need to print over 100 pages a day, five days a week, 52 weeks a year for more than five years straight to reach that figure.

Like many low-end laser engines, the P-110 can grind out 4 pages per minute (ppm), while the LaserWriter II printers boast an 8-ppm maximum. In either case, the figures for maximum output are accurate only if you're printing many copies of the same page or extremely simple pages containing just one font and type size. Printing speed varies dramatically depending on the nature of the job, and few Mac laser-printer engines can keep up with their controllers (see "Testing the Personal LaserWriters").

Ah, but the results are worth waiting for. The P-110 engine produces output that is definitely superior to that of the Canon SX printers. Solid black areas are truly solid black; SX engines often produce discernible scanning lines in large black areas. And you don't have to sacrifice details—the P-110 still handles delicate serifs and hairline rules well. From a print-quality standpoint, it's Canon's best effort yet.

SC: Second Class?

A print engine only partially defines a laser printer's capabilities. It's the controller that counts, and that's where you'll find the major differences between the two Personal LaserWriters. As mentioned earlier, the Personal LaserWriter SC eschews PostScript in favor of the Mac's native tongue, QuickDraw. Instead of containing a complex controller with several megabytes of RAM and ROM, the SC's controller is relatively simple, containing just 1MB of RAM (enough to hold the bitmapped image for one page) and a 68000 microprocessor for handling communications with the Mac and for other basic tasks. Unlike a PostScript printer, the SC relies on the Mac to perform most of the processing required to create a printed page. This dependency has several ramifications—most of them negative.

For one thing, the SC doesn't use font outlines, the mathematical descriptions that enable PostScript printers to output text in a nearly limitless variety of sizes and orientations. Instead, the SC requires that the System file contain a large number of what Apple calls *4X fonts*—bitmapped fonts that are four times larger than the size you want to print. For example, to print 12-point Times, the System file must contain 48-point Times. At printing time, the SC print driver reduces the 4X font by a factor of four to obtain 300-dpi text. This scheme works, but it clutters the System file with space-consuming font sizes. More significantly, it restricts the available type sizes to those sizes for which you've installed 4X fonts.

The SC will ship with the same fonts that come with the IISC—Courier, Times, Helvetica, and Symbol—and some of those fonts are typographically inferior to Adobe's PostScript equivalent. For example, no true italic version of Times is provided, so the SC's print driver slants, or *obliques*, the upright version to create a not-very-reasonable facsimile. Some third-party font packages that include 4X fonts are available, but the selection is small compared to the PostScript world.

The SC's typographic inferiority diminishes, however, if you use the Adobe Type Manager utility, which reads PostScript outline font files and creates bitmapped characters (including 4X versions) in the sizes required. According to Apple, the SC will work with Adobe Type Manager. And of course, the SC's type talents will improve dramatically later this year when Apple releases System 7.0, a new version of the Mac's system software that includes outline fonts for the Mac's screen and QuickDraw printers.

Even with System 7.0 and Adobe Type Manager, however, the SC can't approach a PostScript printer's versatility. As mentioned earlier, the SC can't be shared on a network with other Macs or with IBM PCs. It doesn't support advanced text effects designers might want, such as text printed on a curving baseline. Nor does it provide the slick graphics effects—such as gradient fills, fountains, and shadows—commonly used with PostScript

TESTING THE PERSONAL LASERWRITERS

- LaserWriter IINT
- LaserWriter IINTX
- Personal LaserWriter SC
- Personal LaserWriter NT
- GCC PLP II

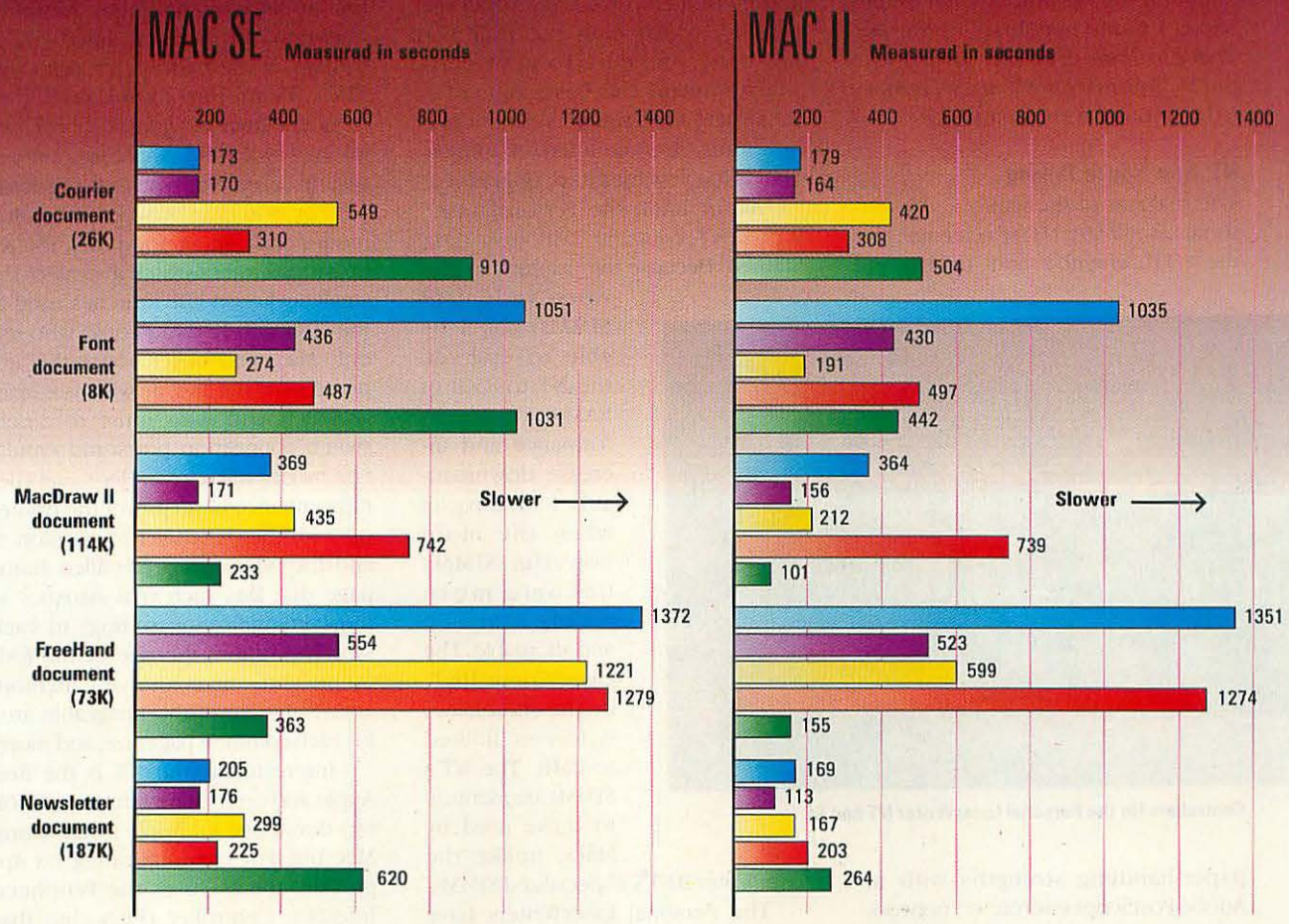
Courier document
A 20-page Word 4.0 document containing double-spaced 12-point Courier with bold and italic.

Font document
A 7-page Word 4.0 document containing the Macintosh character set in a variety of fonts, sizes, and styles.

MacDraw II document
A newspaper graphic containing over 2200 objects and several lines of Helvetica.

FreeHand document
An Aldus FreeHand 2.0 illustration (the sample file named Motorcycle).

Newsletter document
A 4-page PageMaker document containing several fonts, three gray-scale scanned images, and one MacPaint image.



Macworld Labs tested the two Personal LaserWriters with a 1MB Macintosh SE and a 2MB Macintosh II, using the Finder and no RAM cache, with version 6.0 of the LaserWriter driver and a prerelease version of the Personal LaserWriter SC driver. For comparison purposes, we also tested the LaserWriter IINT and IINTX, and GCC Technologies' PLP II using version 2.31 of the PLP driver, with the prebuilt fonts installed.

The results reveal a few surprises. The Personal LaserWriter NT blew away the LaserWriter IINT in the font-document test, thanks to the improved font-rasterizing routines (which generate font bitmaps in the required sizes) in the NT's new version of PostScript. The Personal LaserWriter NT also printed the FreeHand document a bit faster than the IINT did, but in every other test, the IINT was faster than the NT.

As for the QuickDraw-based printers, the Personal LaserWriter SC out-performed GCC's PLP II in printing the font and Courier documents. That isn't surprising, since the PLP II uses outline fonts from which bitmaps must be generated prior to printing. The PLP II, however, turned in dramatically faster times in the MacDraw and FreeHand tests.

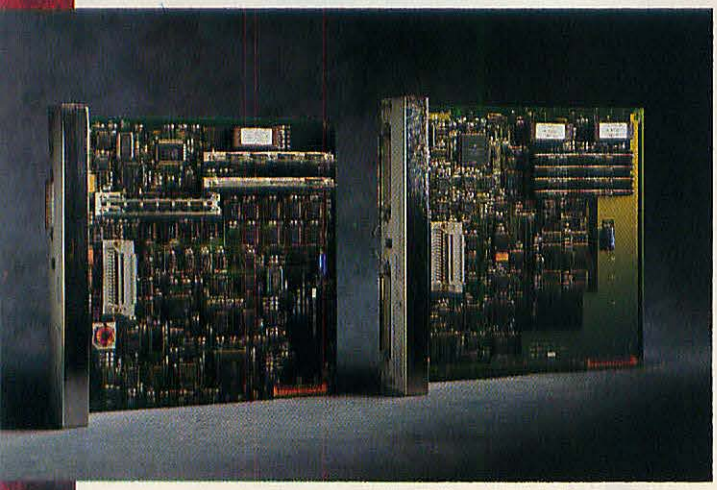
The tests also show that a QuickDraw printer's performance can depend on the Mac it's attached to. The PostScript printers were generally faster when connected to a Mac II than to an SE. (The PostScript performance gap was a bit larger with the newsletter document because its large scanned images benefit from the Mac II's faster SCSI transmission speed.) But the QuickDraw-based Personal LaserWriter SC and PLP II were much faster when used with a Mac II. That's the paradox of QuickDraw laser printers: simpler controllers make them less expensive than PostScript printers, but they perform best on more expensive Macs.

printers. And its simple controller can't do halftoning; to print gray-scale images or halftoned versions of color images, you must use application software such as Aldus PageMaker or Digital Darkroom that can create halftones on non-PostScript printers.

Finally, the first release of the SC's print driver won't allow you to switch between the printer's dual paper sources in the middle of a print job. That's too bad, especially since one of the SC's primary applications is likely to be printing correspondence.

NT: Now You're Talking

The real star of the family is the Personal LaserWriter NT, which combines the P-110 engine's print quality and paper-handling strengths with an Adobe PostScript interpreter, networking features, and just enough expandability. And it costs about $1700 less than the LaserWriter IINT.



Controllers for the Personal LaserWriter NT and SC

Both the NT and the IINT use controllers containing 68000 microprocessors running at 12MHz. (The faster LaserWriter IINTX uses a 68020 running at 16MHz.) Both provide an AppleTalk connector and a 25-pin RS-232C serial connector. Neither provides the parallel printer connector found on many competing printers, including GCC's Business LaserPrinter, HP's LaserJet series, and QMS's PS 810 and PS 820 series. The lack of a parallel port isn't serious, though; the port is used only in the IBM PC world, and even then, it's a less effective connection scheme than a LocalTalk or RS-232C connection, both of which provide a two-way line of communication that lets the printer send error messages back to the computer.

There are as many differences between the NT and IINT as there are similarities. The Personal LaserWriter NT uses a newer version of PostScript—version 51.8—which is faster and more memory efficient than version 47, which both the IINT and IINTX use. And the NT's ROM chips, which contain the PostScript interpreter and the printer's resident outline fonts, are mounted on plug-in SIMMs to allow for future upgrades.

As for RAM, the Personal LaserWriter NT contains 2MB (two 1MB SIMMs). Because the printer can also work with 4MB SIMMs, you'll be able to upgrade the NT to 8MB of RAM to boost performance and increase downloadable font capacity when the more powerful SIMMs become more widely available and affordable. The LaserWriter IINT, on the other hand, is forever limited to 2MB. The NT's SIMMs are identical to those used by Macs, unlike the LaserWriter IINTX's specialized SIMMs.

The Personal LaserWriters have other advantages that will appeal to offices that mix Macs and IBM PCs. Unlike the IINT, the Personal LaserWriter NT provides emulation modes that allow it to imitate both a Hewlett-Packard LaserJet and a Diablo 630 daisy-wheel printer. (The IINT lacks LaserJet emulation.) The NT also provides an extra font—the IBM PC Graphics Extended Character Set—which improves the printer's compatibility with PC applications that don't speak PostScript.

The NT lacks the Apple Desktop Bus (ADB) connector found on the IINT and IINTX, but this isn't a significant omission. A LaserWriter II's ADB port is generally used to connect to multiple-bin paper feeders; such options aren't likely to be in great demand for the Personal LaserWriter NT, though, given its "personal" orientation, and the fact that its multipurpose tray already provides an alternative paper source.

Speaking of which, the NT's PostScript implementation does respond to new PostScript commands that allow application programs to select between the printer's two paper sources in the middle of a print job. Thus, it's up to software developers to modify their programs to allow mid-job tray switching. Apple reports that several developers plan to do just that.

For switching between emulation modes and connection ports, the NT provides a rotary switch instead of the small, awkward DIP switches used in the IINT and IINTX. People who use only Macs may never notice that improvement, but anyone who uses Macs and PCs and who must routinely switch connection ports and emulation modes will rejoice. Here's another nifty enhancement: power the printer up with the switch set to position 4, and the NT prints a fact-filled status page that lists such vital statistics as the communication settings in each switch position, the size of the font cache and other reserved memory areas, the size of the imageable area for each common page size, and more.

Interestingly, the NT is the first Apple add-on to benefit from technology developed for Apple's trailblazing Mac IIfx. For communicating via AppleTalk, the NT uses the Peripheral Interface Controller (PIC) chip that handles serial communication in a Mac IIfx (see "Power at a Price," *Macworld*, May 1990). The PIC chip provides the same benefit in an NT as it does in a IIfx—it handles the grunt work of AppleTalk communication, freeing the processor for more important work, such as imaging the current page. Apple says the NT's PIC improves the controller's performance by 15 to 20 percent. An NT paired with a IIfx would be an especially efficient combination, although you have to wonder how many people would pair a top-of-the-line Mac with a low-cost laser.

Let's Get Personal

So how do the Personal LaserWriters stack up? Lower price tag and im-

proved paper-handling aside, the SC isn't much of an improvement over the LaserWriter IISC. The SC is ideal for producing typographically simple documents—memos, reports, legal briefs, contracts—but it's a poor choice for producing PostScript-based desktop publications, working with scanned images, or creating illustrations using object-oriented drawing programs such as Adobe Illustrator and Aldus FreeHand.

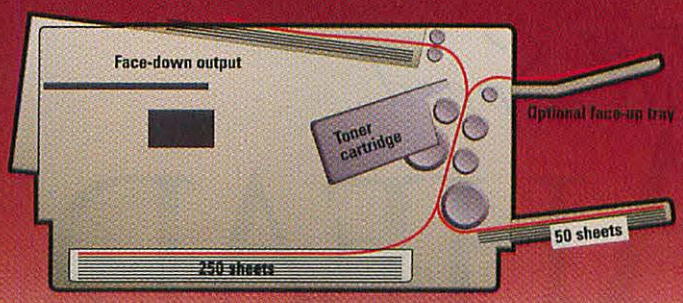
The SC competes directly against GCC Technologies' Personal LaserPrinter II (PLP II). The PLP II has the typographic edge—it uses outline fonts and its driver even provides kerning and tracking features that work across all applications (see *Reviews, Macworld,* June 1990). The PLP II also costs less, retailing for just $1399.

But the PLP II falls short of the Personal LaserWriter in some areas. It holds less paper than the SC and it lacks the SC's slick multipurpose paper tray (although the value of the SC's tray is diminished as long as the SC driver doesn't support mid-job tray switching). The PLP II also has only one SCSI connector. The PLP II often forces you to endure a cumbersome two-step printing routine, especially on a Mac that has just 1MB of memory. And, unlike the Personal LaserWriter SC, the PLP II can't be upgraded to a PostScript printer.

If you're determined to do desktop publishing or other type-intensive jobs on a non-PostScript printer, the PLP II's outline fonts make it the better choice for now, provided you don't mind the other limitations. If you'll be printing typographically simple documents—or if you're willing to lean on Adobe Type Manager until System 7.0 arrives—the SC is the better printer. But keep in mind that even with System 7.0, the SC still won't be able to do everything an NT can.

The NT is, quite simply, the hottest PostScript printer in its price range. The HP LaserJet IIP is more expensive, with a list price of $3455 in its PostScript configuration. GCC's $3299 Business LaserPrinter provides a parallel port and even a SCSI port that accepts a hard disk for font storage, but its Ricoh 1060 engine prints blacks poorly and lacks the NT's paper-handling prowess.

THE PERSONAL PAPER PATH



A Personal LaserWriter's paper tray holds 250 sheets—50 more than a LaserWriter II. (A letter-size tray will be included with the printers; legal-size and envelope trays will be options.) Manual-feed enhancements include a simple, single-page manual-feed slot. The Personal LaserWriters also have a multipurpose paper tray that holds up to 50 sheets of paper or 5 envelopes.

The printer automatically knows to use the multipurpose tray when you click on the Manual Feed button in the Print dialog box. In theory, the printer can automatically switch between paper sources during a print job, printing the first page on letterhead from the main tray and then printing second sheets or envelopes from the multipurpose tray, for instance. In practice, you can take advantage of this feature only if you are using a Personal LaserWriter NT with software that supports the necessary commands.

Like a LaserWriter II, a Personal LaserWriter delivers its output face-down. The output stacks a bit more neatly in a Personal LaserWriter, however, thanks to a thoughtfully designed output tray with a weighted band that rests on the printed pages and keeps them from becoming skewed. The Personal LaserWriters also offer a face-up output tray that snaps out like a LaserWriter II's. When you use the multipurpose tray along with the face-up tray, paper moves through the engine in a nearly straight line. That minimizes curling and jams, and allows reliable printing on labels and heavier paper stocks.

Finally, what about the LaserWriter IIs? The IINT remains an uninspiring performer; if you need a midrange PostScript printer, the QMS-PS 810 is a better choice, providing HP LaserJet emulation, faster performance, and a parallel port. The LaserWriter IINTX, with its SCSI port and fast, expandable controller, remains an excellent printer for complex graphics and typographic applications.

After watching Macs grow more sophisticated and more expensive in the past few years, I find it refreshing to see Apple turn its attention to the lower end of the market. Some people would like to see Apple develop an even more affordable 300-dpi printer, perhaps one based on an ink-jet technology similar to that of HP's DeskWriter. But such an alternative would probably be as slow as a DeskWriter (about a page a minute). The Personal LaserWriters strike a better balance, providing 300-dpi output at a reasonable pace—and a reasonable price. M

See *Where to Buy* for contact information.

Contributing editor ***Jim Heid*** *has worked with over 40 laser printers since Hewlett-Packard's first LaserJet appeared in 1984. His latest book, coauthored with Peter Norton, is* Inside the Apple Macintosh *(Brady, 1989).*

Full Speed AHEAD

17 Accelerators Tested

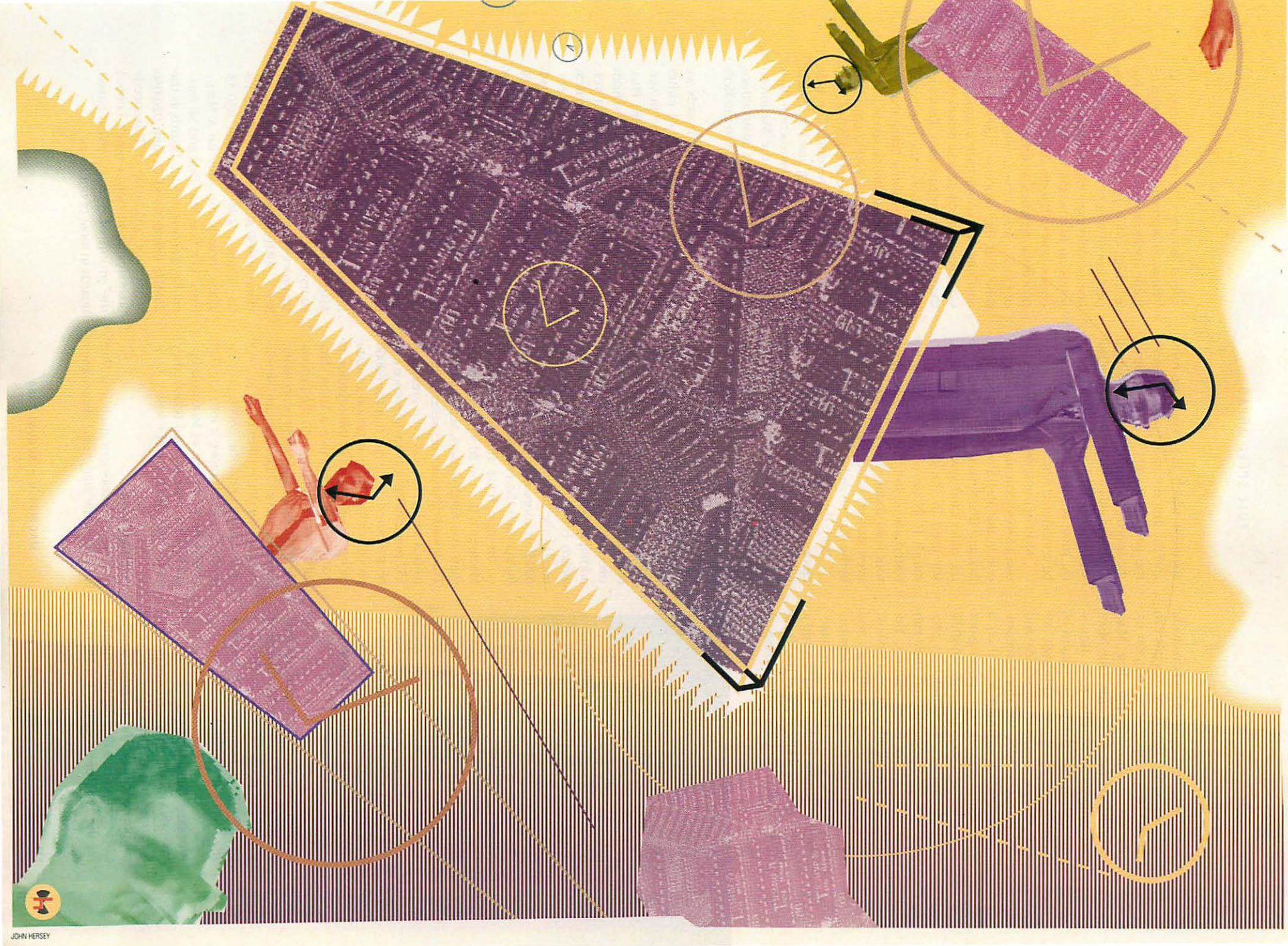
Exactly one year ago, DayStar Digital introduced a souped-up Macintosh II accelerator board based on a 50MHz 68030 processor (the fastest processor Motorola currently sells). At *Macworld* we knew the board would be fast. And we knew we wanted one. But we debated whether many consumers would plunk down $7000 for the privilege of having the fastest Mac around.

Last year, 68030-based accelerators were too costly and too exotic to be practical. Now they are the status quo.

Then something wonderful happened. Apple introduced a workstation-class Mac—the IIfx—and priced the Macintosh II upgrade at an aggressive $2995 (not including the cost of upgrading the Mac II's memory). DayStar's 50MHz board tumbled to $2995 for a fully configured accelerator and other vendors dropped their prices as well. Novy's 16MHz 68030-based Quik30 board (which makes a Plus run faster than an SE/30) now costs $1490 (this price includes a math coprocessor chip). It wasn't that these vendors had overpriced their products before, it was just that Motorola dropped its processor prices, in preparation for the next-generation 68040 processors.

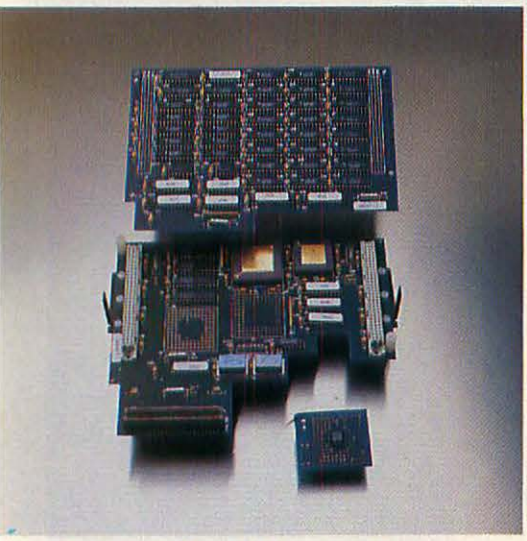
by Cheryl England Spencer





JOHN HERSEY

With prices for high-end products within a range that mere mortals can afford, and with System 7.0 upon us, the time is ripe for upgrading. Macworld Labs ran 17 boards—for Macs ranging from a 128K to a IIcx—through 37 tests that encompassed 16 different applications. Although we tested boards based on 68020 and 68030 processors, we don't recommend buying anything less than a 68030. In fact, vendors are phasing out 68020-based accelerators: 68020 boards tend to cost as much to produce as 68030 boards, and they run slower and have fewer features. Besides, taking full advantage of System 7.0's virtual-memory capabilities will require using the 68030 processor, which has special memory-management functions built in. You can add a 68851 chip to a Mac II to get the same functionality, but buying a 68020-based accelerator and then adding this PMMU (Paged Memory Management Unit) chip is no longer cost-effective (assuming the board even includes a slot for the extra chip).



LUIS DELGADO

On the DayStar PowerCards, one board (top) contains banks of SRAM. The main accelerator board (middle) holds the SRAM board, the faster processor, and the math coprocessor.

Processor Considerations

There's a lot of jargon in the accelerator arena, but it all boils down to a few simple concepts. The speed at which a Mac can process data depends mainly on the type of processor it has, the speed at which the processor runs, and the amount and type of memory the processor uses. Other factors—the speed of a hard disk and the speed of a network—also affect how fast the Mac runs, but the processor itself has the most impact on speed and should be considered first.

Most of the accelerators we tested use a 68030 central processor like the one in the Macintosh SE/30, IIx, IIcx, IIci, and IIfx. Several products still use the older (and slower) 68020 processor used in the discontinued Macintosh II. None of the products we tested, and in fact, few of the accelerators sold today, use the older (and even slower) 68000 processor found in the Mac SE and earlier models.

Both the 68020 and the 68030 include a 256-byte *instruction cache,* which holds a copy of the last 64 instructions that the processor executed, along with any associated addresses. The assumption is that the processor will often request these instructions again within a short time. Fetching the information from the cache within the processor is much faster than fetching it from memory on the main logic board. The 68030's speed advantage over the 68020 is partly due to the addition of a 256-byte *data cache,* which holds the data most recently used by the processor. In addition, the 68030 is more efficient at processing instructions than the 68020.

In our tests the 68030-based Macintosh IIcx ran 20.3 percent faster than the 68020-based Macintosh II. The speed difference between a Macintosh II and a Plus was even greater—157 percent. Part of the difference can be attributed to the fact that the 68000 processor has no instruction or data cache. Another part of the equation is that the 68000 only uses a 16-bit data path for moving data into the processor. The 68020 and 68030 processors, however, use a 32-bit data path. Simple math shows that it takes twice as long to move data into the 68000 processor as it does to move it into the 020 or 030. Furthermore, as Motorola upgraded from the original 68000, they made the chips more efficient.

Clocking Speed

The type of processor used in a Mac isn't the only factor that determines speed, however. In order to take advantage of a processor's maximum reliable speed, an accelerator must run at a high *clock speed.* Every time you perform an action, whether drawing a line or deleting a character, software sends an instruction telling the processor how to handle the action. The processor requires a certain number of *clock cycles* (the smallest unit of time that the processor uses to do anything) to execute each instruction. Complex instructions take more cycles than do simple instructions. The clock speed simply denotes the number of cycles (and thus, instructions) that the processor can run in one second.

The IIfx uses a 68030 chip running at a clock speed of 40MHz or 40 million cycles per second. The next fastest Mac, the IIci, uses a 25MHz 68030. If the average instruction takes 5 cycles to run, then the Macintosh IIfx averages 8 million instructions each second as compared to the IIci's 5 million per second.

The 68020 accelerator boards we tested used clock speeds of either 16MHz or 25MHz, and came in versions for the Mac 128K, 512K, Plus, and SE; the 68030 boards ranged from 16MHz to 50MHz and came in versions for the Mac 128K up to the IIcx. Generally, the 68020-based boards performed more slowly than the 68030-based boards no matter what the clock speed. The Radius Accelerator 25 for the Macintosh SE beat the Macintosh II by only a slight margin—the 16MHz Gemini 68020–based board did better because of a fast, custom SCSI port and some additional features. Still, either of these boards will noticeably speed up a Macintosh Plus or SE.

You need a 50MHz 68030 board, however, to come close to gaining Macintosh IIfx performance. Thanks to its more efficient memory and extra processors, the IIfx even beat DayStar's 50MHz PowerCard 030, the Siclone Si3050 Accelerator, and the Total Systems 50MHz Voyager 030-33. These boards run only on a Macintosh II or IIcx; Mac Plus and SE owners have access to such boards as the 25MHz 68030-based Gemini 020/030 accelerator card, however. This speedy board came in only a notch behind the group of 33MHz 68030-based boards in most of our tests.

Thanks for the Memory

If all of the details surrounding processors and clock speeds have you reeling, you may want to take a break before diving into the most confusing area of all—memory. In order to take full advantage of a faster processor, accelerators usually require faster memory than that on the main logic board. The type of Mac you are upgrading often determines what form that memory takes—dynamic RAM (DRAM) or high-speed static RAM (SRAM), SIMMs or other special chips.

For instance, to upgrade a Macintosh Plus or SE, you generally add DRAM to the accelerator board (at a cost above the base price of the board). Macintosh SEs come standard with 150-nanosecond (ns) DRAM. This DRAM takes 150ns (150 billionths of a second, if you can fathom that) to complete a memory access. But if you upgrade that SE with, say, Novy's 33MHz 68030 Quik30 board, then you need to add faster memory to the board in order for the system to keep up with the faster processor.

You can run the board without any additional memory, but performance gains will not be as significant as they could be—the board will need to access the RAM on the 68000 main logic board and this memory uses only a 16-bit data path. Thus, the accelerator takes twice as long to grab the 32 bits of data that a 68020 or 68030 processor needs. Also, because the logic board's RAM is slower than the processor, you'll end up adding *wait states*.

A wait state is just what its name implies—a bit of time that the processor is programmed to wait while the main logic board readies data. Adding faster memory won't speed up the system, however, because the processor expects information from RAM after a specific interval. With faster memory, information may appear before the processor is ready. It's generally most cost-effective to match memory speed to processor speed.

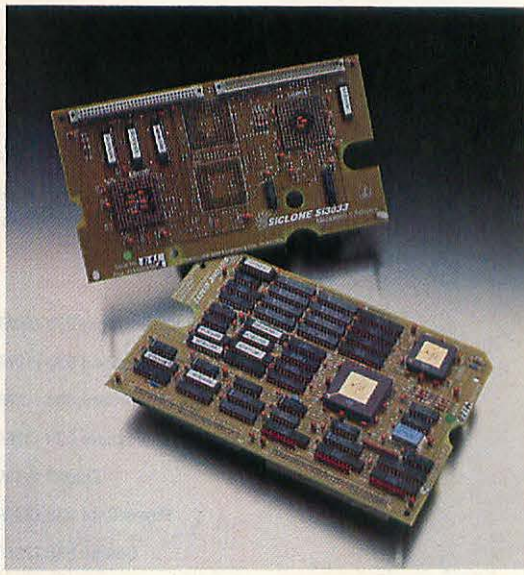
Another way to improve the speed of boards that use DRAM is to copy an image of the Mac's ROM into faster 32-bit RAM on the accelerator board. The speed of ROM-resident functions such as Toolbox routines and QuickDraw routines is much increased this way. (All of the boards that use DRAM support this ROM copy feature.) In general, however, the faster the processor and the clock speed, the faster the board (see "See How They Run").

Static RAM Upgrades

Upgrades from Siclone (II, IIx), DayStar (II, IIx, IIcx), Radius (Plus, SE), and Total Systems (Voyager 030 boards for the II, IIx) require no additional memory, nor do they require that you upgrade the memory on a Mac's main logic board. Instead, these boards include a small amount of expensive, but superfast, 20ns SRAM that acts as an additional cache between the processor and the slower (but cheaper) system memory. This cache is critical to obtaining optimum performance because a fast processor is forced to wait each time it has to read data from the slower DRAM on a Macintosh logic board. By placing the most frequently used data in SRAM, the processor can retrieve data when it needs it, without having to wait for logic-board memory.

As the results show, boards that use SRAM are fast, but no boards—not even the 50MHz 68030-based boards—are faster than the Macintosh IIfx. The IIfx main logic board contains a 32K SRAM cache that is fine-tuned to work with the IIfx's sophisticated memory-management system. The down side of this system is that Apple's $2995 Macintosh II upgrade requires the addition of new memory. DayStar's similarly priced 50MHz PowerCard 030 works fine with the Macintosh II's SIMMs.

Simply adding more SRAM does not necessarily make an accelerator faster. For instance, Siclone's boards come with twice as much SRAM as DayStar's boards, but the products run at equivalent speeds. That's because the DayStar boards use *two-way set-associative caching* instead of the Siclone boards' *direct-map caching*.



LUIS DELGADO

Siclone's Si3033 adapter board (top) holds the Mac's original processor and PMMU and fits into the Mac's empty processor sockets. The accelerator (bottom) contains the new, faster processor, SRAM, and the math coprocessor and plugs into the adapter.

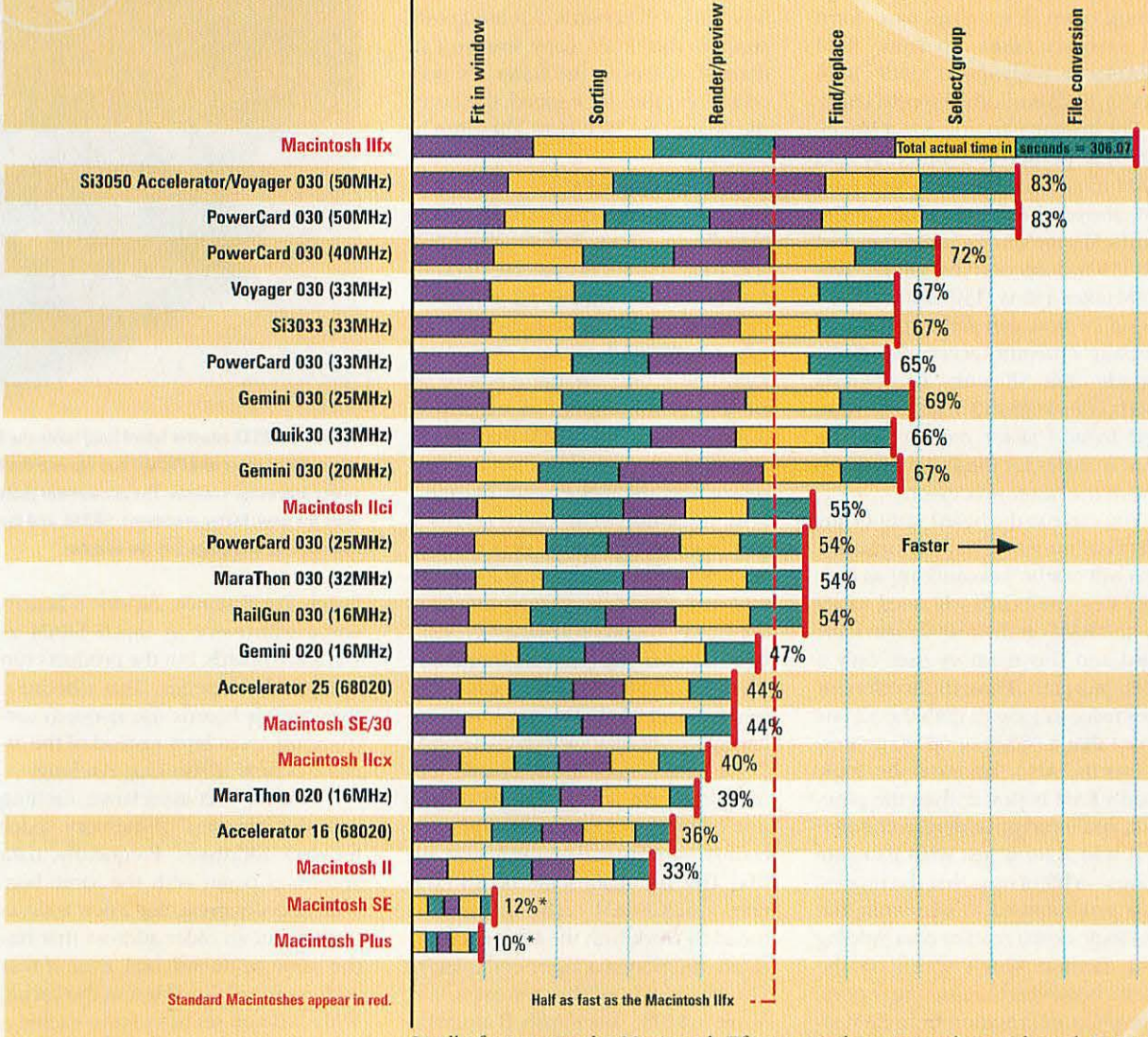
Two-way set-associative caching provides two sets of memory space for data addresses. Frequently, data addresses begin with the same bits. With direct-map caching a new address flushes out an older address that has the same beginning bits, even if that address is not the oldest in the cache. With two-way set associative caching, the new address is written to a different memory space than the old ad-

MACINTOSHES COMPARED

	Macintosh Plus	Macintosh SE	Macintosh II	Macintosh SE/30	Macintosh IIx/IIcx	Macintosh IIci	Macintosh IIfx
Processor	68000	68000	68020	68030	68030	68030	68030
Clock speed	8MHz	8MHz	16MHz	16MHz	16MHz	25MHz	40MHz
Math coprocessor	none	none	68881	68882	68882	68882	68882
Coprocessor speed	NA	NA	16MHz	16MHz	16MHz	25MHz	40MHz

SEE HOW THEY RUN

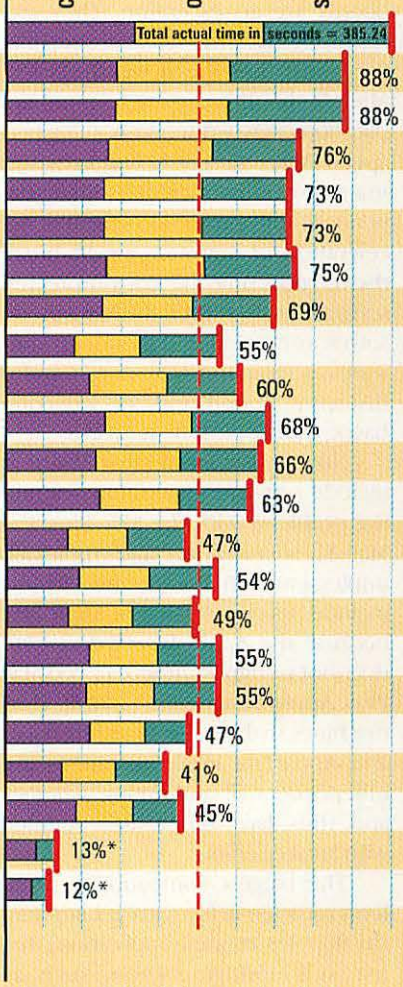
PROCESSOR-INTENSIVE TASKS



In all of our tests, the Macintosh IIfx outraced every accelerator board. Using this speedy Mac as our base, we indexed the numbers for the other products, presenting the results as a percentage of the Mac IIfx's speed. For example, for tasks that make extensive use of the processor (such as sorting and rendering), the 50MHz 68030-based Siclone Si3050 and the similar Voyager 030 ran 83% as fast as the Macintosh IIfx. The Macintosh Plus creeped along only 10% as fast.

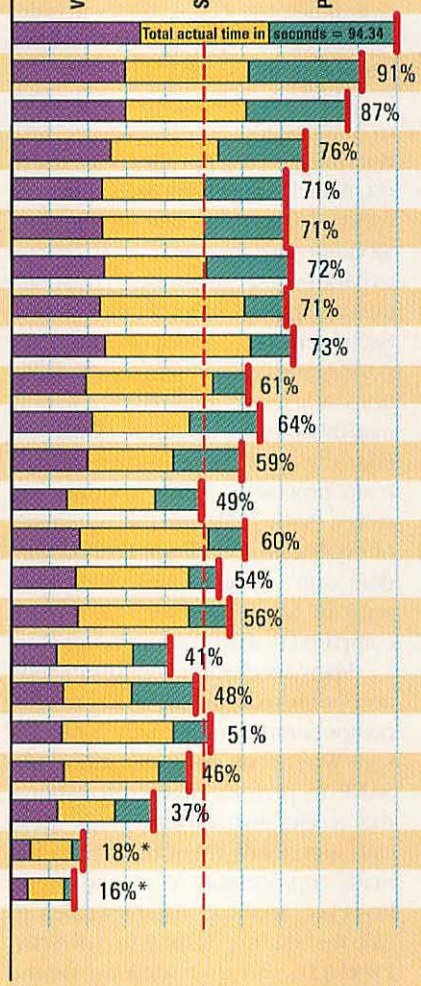
* Graphed speeds for the Macintosh SE and Macintosh Plus appear slightly faster than real-life speeds. Since these 68000-based Macs cannot run VersaCAD or Mathematica, they were unable to perform all portions of the fit-in-window test, the open test, and the Mathematica plot test.

TASKS INVOLVING DISK ACCESS



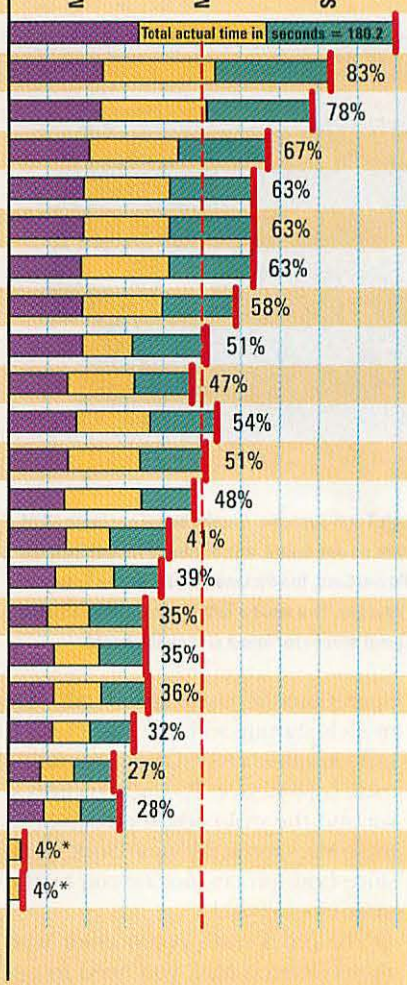
Many everyday jobs require that a Mac read data from a hard disk. Loading data from disk and saving data to disk are two prime examples. Some boards such as the 16MHz Gemini 020 include a custom SCSI port that speeds up data transfer. That's why the Gemini 020 beat out the similarly equipped Accelerator 16 from Radius.

TASKS INVOLVING VIDEO RESPONSE



The speed at which documents scroll depends not only on processor speed but also on how quickly the video board can respond to such requests. Even with a larger screen, the modular Macs are faster than the compact Macs.

MATH-INTENSIVE TASKS

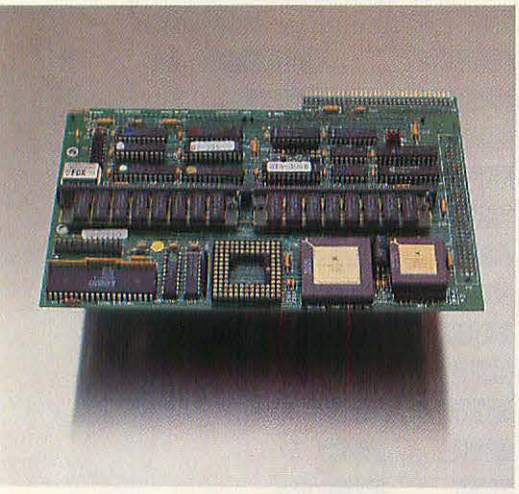


The results here are clear. With mathematical tasks such as plotting the result of a function in Mathematica or recalculating a spreadsheet, the fastest floating-point unit wins. For the spreadsheet recalculation tests, we created a large spreadsheet chock full of equations and ran a recalculation in Excel and Wingz.

dress. The processor has a greater chance of finding the information it needs in the cache. Neither type of caching is more effective than the other; just be aware that a board with, say, 64K of SRAM is not necessarily faster than a board with 32K.

Speeding Up Mathematics

While the type of processor and its clock speed determine how fast a Mac runs overall, you'll need a math coprocessor chip to run floating-point operations at warp speed. All Mac models starting with the Macintosh II include either a 68881 or a faster 68882 math coprocessor. The math coprocessor and the main 68030 processor in these Macs run at the same clock speed since both processors are run by the same clock crystal.



LUIS DELGADO

Even though Total Systems' Gemini board contains all of its hardware on one board, it is harder to install than the DayStar PowerCard, the Siclone Si3033, or the Total Systems Voyager. You need a Killy clip to strong-arm the Mac's original processor into a slot on the board.

To run a math coprocessor with an accelerated Mac, you need to upgrade the coprocessor to have a clock speed that matches the speed of the accelerator's processor. For instance, although the Macintosh IIx includes a 16MHz 68882, you need to purchase a 50MHz 68882 to run with Siclone's 50MHz Si3050 Accelerator. The Dove MaraThon 030 board is the only exception. The Mac II version lets you use the Mac's math coprocessor even though it runs at a slower clock speed than the 32MHz Marathon 030. The Plus and SE versions of this board don't support a math coprocessor, since these Macs don't include one.

Some companies, such as DayStar, Novy, and MacProducts, let you add a faster clock crystal for the math coprocessor, but this option is really only worthwhile for people who consistently perform lengthy calculations; short calculations will be done before the central processor is ready, thus negating any coprocessor speed advantage. The 68881 comes in two speeds—16MHz and 25MHz—although only the 16MHz is cost-effective. Since the 68882 offers a wider range of clock speeds, most vendors support it only.

The only other jargon you need to understand when working with floating-point operations is SANE (Standard Apple Numerics Environment). Earlier Macs like the Plus and SE don't have the hardware necessary to perform fast calculations. They don't include a math coprocessor, and a 68000 series chip is not optimized for performing fast mathematical calculations. As a result, Apple created mathematical software routines (SANE) to take the processing burden off the main processor. These routines are stored in the ROM and the System file of every Mac so that application vendors don't have to write their own versions. SANE, however, is slow when compared to a math coprocessor chip.

Many accelerator vendors include an option to route all mathematical computations to the math coprocessor. Whenever an application calls SANE to perform some calculations, the accelerator software traps these calls and sends them directly to the math coprocessor. More and more, however, applications are written to call the math coprocessor directly. Excel 1.04 and later versions use the math coprocessor directly and Mathematica requires a coprocessor to run.

But SANE won't become obsolete any time soon—SANE software routines are more accurate than the hardware routines found in the math coprocessor (although both sets of routines meet the IEEE standards for accuracy). For most people the hardware routines are sufficiently accurate. But for some specialized applications, the exactness of SANE may be required. That's why accelerator vendors are careful to let you choose whether or not their SANE traps are turned on. Also, Macs that don't include a math coprocessor need SANE. Some vendors, such as Radius, include a custom version of SANE that runs faster than Apple's SANE and it meets the IEEE standard, although it is not as precise as the Apple SANE.

Incompatibilities

Whenever you upgrade a Mac with new hardware, you run the risk of creating incompatibilities. Accelerator boards are no exception. They are, however, much less troublesome than they were when the SE was the fastest Mac. At that time, many software applications were written without higher-speed Macs in mind. For instance, many programs included timing-dependent copy-protection schemes. Acceleration of any sort would break them, rendering the copy-protected software useless. Even the Macs themselves used timing-dependent software—accelerators were notorious for distorting sound and for wreaking havoc with AppleTalk networks.

Now most accelerator vendors include software that eliminates timing problems with the Mac Plus and Mac SE sound driver and AppleTalk implementation. For instance, Radius includes its own version of AppleTalk because the Apple LaserWriter IINT does not recognize an accelerated Mac Plus. Apple designed the Mac II–class machines so that their sound-manager and AppleTalk implementations are independent of any timing schemes and, thus, have no problem running with an accelerator.

The biggest compatibility problems today lie in formatting high-density floppies; running applications that use self-modifying code, such as MacWrite 4.5; and playing some games. Macs that have Apple's SuperDrive upgrade cannot format high-density floppy disks while running in an accelerated mode because Apple's driver software is highly timing-dependent; it expects the processor to run at, say, 16MHz and no faster. Some vendors, such as DayStar and Radius, include a software fix that automatically slows down the processor while the floppy drive is accessed. (Dove, on the other hand, forces you to turn

off the processor's cache via a cdev before formatting floppies.) Still other vendors, Siclone, for instance, build a buffer into the accelerator to trap the faster processing while the floppy is accessed. Both methods slow down processing a bit while the floppy drive is accessed but they both work well.

Although incompatibilities are becoming a thing of the past—especially as vendors update their software to run on newer, faster Macs—you may still occasionally run into trouble. Most of the boards let you solve incompatibility problems by turning off the accelerator completely. Pressing the Interrupt and Reset buttons in a special combination while restarting the Mac returns control to the original processor. But the best products provide software that lets you turn the processor's instruction cache, data cache, and math coprocessor on and off. Frequently you can solve incompatibilities by turning one of these options off, thereby saving yourself the hassle of groping around for the Reset and Interrupt switches.

For example, until we turned the Dove MaraThon 020's math coprocessor off, 4th Dimension, ModelShop, and MacWrite II would not run reliably. We first tried turning off the board's instruction cache (quite often, turning off one or more caches will solve a problem), but that didn't help. Only when we turned off the math coprocessor (via a cdev) did the programs run correctly. When using an accelerator, you may need to experiment a bit to make all of your applications run correctly.

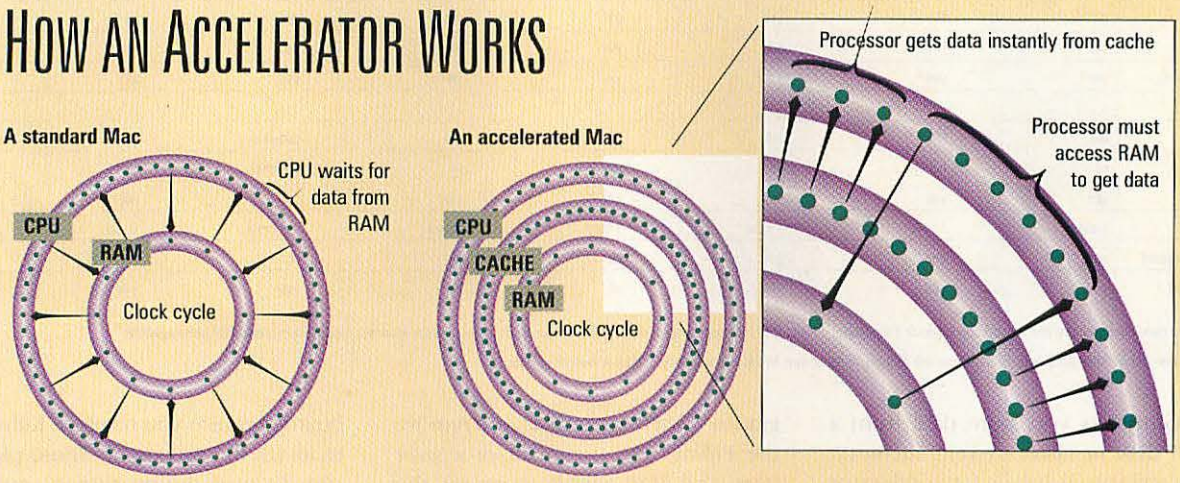
Other Options

When purchasing an accelerator, you should also consider whether the vendor offers any optional goodies such as expansion ports, fans, or disk-caching software. For instance, the Radius accelerators include a connector for Radius's Two Page Display or Full Page Display. You still need to purchase the monitor-interface board, but at least you'll have room in the Plus or SE to install another board.

Some accelerators for the Mac 512K, Plus, and SE have a provision for an optional SCSI port that runs at the same high transfer speeds as the SCSI port on a Mac II. This is because a SCSI port on an earlier Mac can easily become a bottleneck once the processor is accelerated. Total Systems' Gemini boards include a fast (1MB-per-second) SCSI port that supports blind reads and writes. (In a blind read or write the hardware bypasses the hard-disk driver.) Novy offers an optional SCSI port. Because the SCSI port was not included on the board we tested, the Novy Quik30 tested out slower than the 68030-equipped Gemini on disk-intensive operations like opening and saving files.

The only other options that are really handy are fans for the Mac 512K and Plus, and disk-caching software. The cramped quarters of the compact Macs combined with the heat generated by the accelerator boards means that you need a fan to keep the Mac running reliably. Disk-caching software such as Novy's Smart Cache (which is also included with MacProducts'

How an Accelerator Works



In a standard Macintosh, the processor must fetch instructions from the RAM where they are stored. But because the Mac's RAM is slower than the processor, the processor must wait to receive the instructions. The processor is ready to work at each point in the diagram where there is a green dot. But processing can be done only when the data in RAM is synchronized with the processor (which is displayed here with arrows).

Many accelerator boards work by adding a layer of super-fast memory between the Mac's RAM and the processor. When the processor requests information, this layer (the cache) grabs the information from the Mac's RAM and passes it to the processor. The cache also stores a copy of the information; the next time the processor needs the information, the cache provides it instantaneously. This scheme works much of the time since the Mac uses a lot of the same QuickDraw calls repeatedly. But because the cache fills up and flushes the least recently used data, the processor is occasionally unable to find the data it needs. The processor must then refer back to the Mac's RAM to grab the data, thus wasting processing time as it would in a nonaccelerated Mac.

ACCELERATOR FEATURES

	DayStar Digital	Dove	Dove	MacProducts USA	MacProducts USA	Novy	Radius	Radius
Product	PowerCard 030	MaraThon 030	MaraThon 020	RailGun 030	RailGun 020	Quik30	Accelerator 16	Accelerator 25
Processor	68030	68030	68020	68030	68020	68030	68020	68020
Price as tested [1]	$1495 (25MHz) $1995 (33MHz) $2495 (40MHz) $2995 (50MHz)	$699 [2]	$1619	$1075 (16MHz) [3] $1475 (25MHz) [3] $1899 (33MHz) [3]	$775 (16MHz) [3] $999 (25MHz) [3]	$1490 (16MHz) $1940 (25MHz) $2422 (33MHz)	$1095	$1895
Math coprocessor	included	none [2]	optional	optional	optional	optional	optional	optional
Processor speed	25MHz, 33MHz, 40 MHz, 50MHz	32Mhz	16MHz	16MHz, 25MHz, 33MHz	16MHz, 25MHz	16MHz, 25MHz, 33MHz	16MHz	25MHz
Macintosh compatibility	II, IIx, IIcx	II, SE/30, IIx, Plus, SE	SE	128K, 512K, Plus, SE	SE	512KE, Plus, SE	Plus, SE	SE
Type of memory	32K SRAM	none	SIMMs	SIMMs	SIMMs	SIMMs	32K SRAM	32K SRAM
Possible RAM configuration	NA	NA	1MB, 4MB	1MB, 4MB	1MB, 4MB	1MB, 4MB	NA	NA
Suggested speed of on-board RAM (in ns)	NA	NA	120	120, 100, 70	120, 100	120, 100, 70	NA	NA
Provides custom SANE	yes	no	yes	yes	yes	yes	yes	yes
Sound patch	NA	NA	yes	yes	yes	yes	yes	yes
AppleTalk patch	NA	NA	yes	yes	yes	yes	yes	yes
Enable and disable:								
CPU instruction cache	yes	yes	yes	yes	yes	yes	yes [5]	yes
CPU data cache	yes	yes	NA	yes	NA	yes	NA	NA
SRAM cache	yes	NA	NA	NA	NA	NA	NA	NA
accelerator	no	no	yes	yes	yes	yes	yes [5]	yes
math coprocessor	no	NA	yes	yes	yes	yes	no	no
SANE traps	yes	NA	yes	yes	yes	yes	yes	yes
Can format high-density floppy disks	yes [6]	yes [6]	yes [6]	yes [6]	yes	yes	yes	yes
Fan included [7]	NA	NA	NA	optional	NA	optional	yes	NA
Custom SCSI port	no	no	no	optional	no	optional	no	no
Upgrade path	yes	yes	yes	yes	yes	no	no	no
Warranty	1 year	1 year	1 year	1 year	1 year	6 months	1 year	1 year
Toll-free telephone support	yes	yes	yes	no	no	no	no	no
Online service support	yes	yes	yes	no	no	yes	yes	yes

[1] Prices listed include maximum memory and a math coprocessor if available. [2] Uses the math coprocessor on the Mac's main logic board. [3] Price assumes that memory costs $69 per megabyte.

[4] Macintosh SE versions are $100 to $200 less. [5] On Macintosh SE only. [6] Must turn off caches manually. [7] Plus accelerators only.

RailGun) lets you store data from a hard disk in faster system memory. This software is handy for accelerator boards that use SIMMs—the main logic board memory is disabled with these boards and without disk-caching software logic-board memory would sit idle.

Ease of Installation

Although we encountered very few problems installing the boards, some were definitely easier to install than others. Siclone's boards come with clear, step-by-step installation instructions that include lots of good photographs. With these boards, you remove the PMMU and the main processor from the Mac, install them on the Si3033 or Si3050 adapter module, and install the adapter in the empty processor sockets. You then install the Si3033 or Si3050 accelerator (which contains the faster processor, the math coprocessor, and SRAM) on the adapter module. Likewise, Dove's MaraThon boards and DayStar's PowerCards were easy to install and included clear instructions.

A few boards were much more frustrating to install. Total Systems' Gemini boards and the Novy Quik30 boards require you to use a Killy clip to install the processor. These plastic clips fit over the processor; you use them to press the processor into a slot on the accelerator board. This may sound relatively easy, but it takes some muscle to push the chips into the sockets and some finesse to keep from ruining them in the process. In addition, the Plus's cramped interior combined with the size of the accelerators makes for a tight fit—any accelerator for a compact Mac will be harder to install than one for a modular Mac.

Most of the vendors, however, recommend that you let a dealer in-

Siclone	Total Systems	Total Systems	Total Systems	Total Systems
Si3033/Si3050	Gemini 020/030	Gemini 020/030	Mercury-16	Voyager 030
68030	68020	68030	68030	68030
$1999 (33MHz) $4299 (50MHz)	$1395[4]	$1855 (20MHz)[4] $2155 (25MHz)[4]	$845	$1995 (33MHz) $4295 (50MHz)
optional	optional	optional	optional	optional
33MHz, 50MHz	16MHz	20MHz, 25MHz	16MHz	33MHz, 50MHz
II, IIx	128K, 512K, Plus, SE	128K, 512K, Plus, SE	128K, 512K, Plus, SE	II, IIx
64K SRAM	SIMMs	SIMMs	SIMMS	64K SRAM
NA	1MB, 4MB	1MB, 4MB	NA	NA
NA	120	100	NA	NA
yes	yes	yes	yes	yes
NA	yes	yes	yes	NA
NA	yes	yes	yes	NA
yes	yes	yes	yes	yes
yes	NA	yes	yes	yes
yes	NA	NA	NA	yes
yes	yes	yes	yes	yes
no	no	no	no	no
yes	yes	yes	yes	yes
yes	yes	yes	yes	yes
NA	yes	yes	yes	NA
no	yes	yes	yes	no
yes	yes	yes	yes	yes
1 year	1 year	1 year	1 year	1 year
yes	yes	yes	yes	yes
yes	yes	yes	yes	yes

stall the accelerator. Some dealers offer free installation of boards that they sell. Others charge you a fee of anywhere from $50 to $100. If you are at all squeamish about tinkering around inside a Mac (near high-voltage components) we advise letting a dealer take care of installation for you.

Recommendations

During Macworld Labs' testing none of the boards failed to run correctly; we recommend any of these boards to someone looking for an upgrade. However, we do think you'll be better off with a 68030-based accelerator since the price-to-performance ratio is better and because the processor offers more features. We also recommend buying the fastest board your wallet allows. But if you are concerned about getting the most speed for your dollars, here are our suggestions.

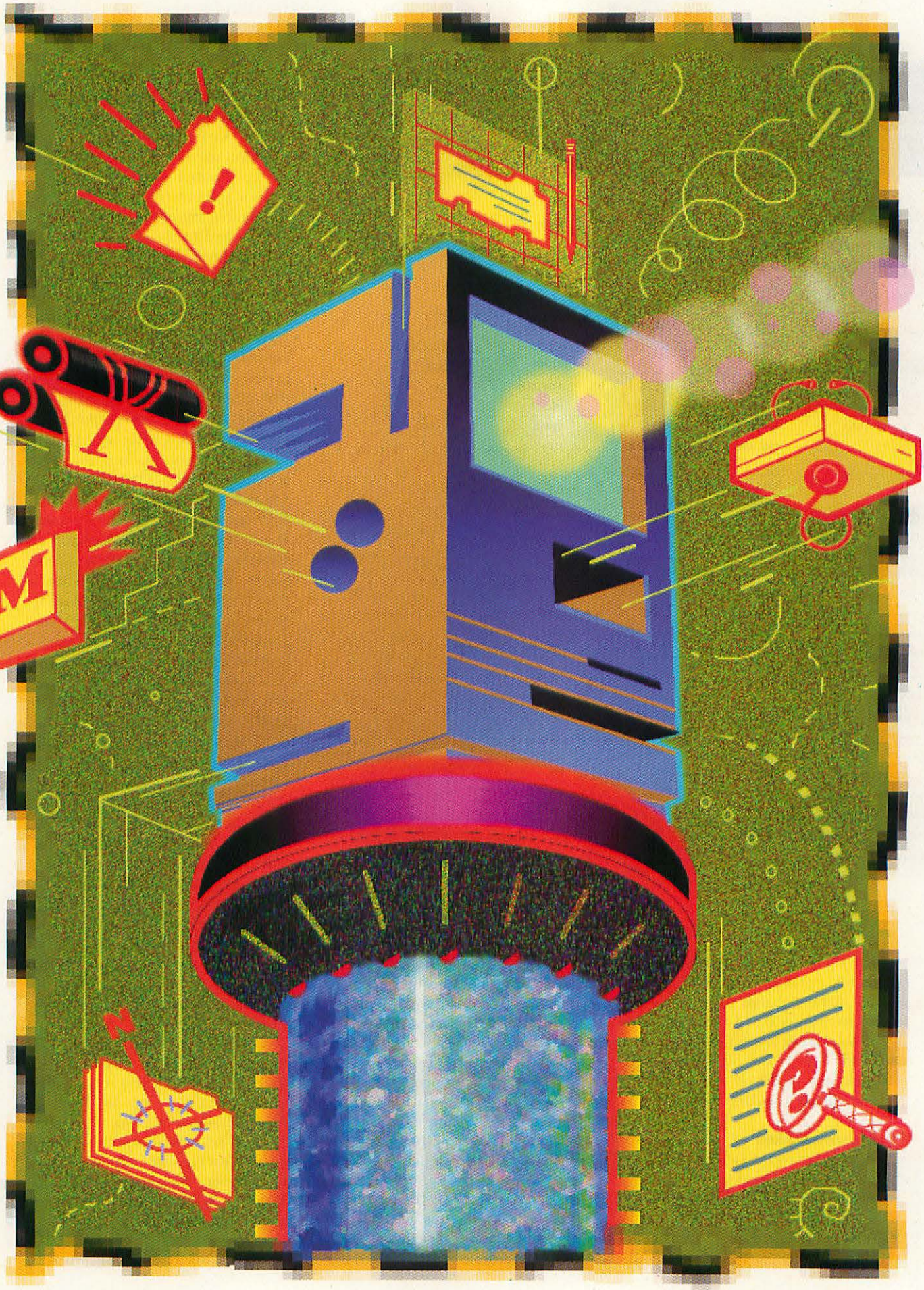
Mac IIcx owners have no choice but to go the DayStar route. The least pricey board, the 25MHz PowerCard 030 runs a Mac IIcx at IIci speeds and costs a lot less than the official Apple upgrade. DayStar's 50MHz board also runs in the IIcx and is currently the only choice for IIcx users who want IIfx performance. DayStar's 33MHz PowerCard 030 costs 33 percent more than the 25MHz version but only gives you about a 10 percent speed increase—we recommend sticking with the 25MHz PowerCard 030 or going for broke with the 50MHz version.

For Macintosh II and IIx owners, the choices are wider. DayStar, Dove, Siclone, and Total Systems offer competing 68030-based accelerators in speed ranges of 25MHz to 50MHz. As with IIcx accelerators, we think most people will find DayStar's 25MHz PowerCard for the II, IIx, and IIcx fast enough. If you need ultimate performance, we recommend Apple's Macintosh IIfx upgrade. The Macintosh IIfx provides faster input and output, faster memory access, and faster handling of AppleTalk data packets than any accelerator. Dove's 32MHz MaraThon 030 board is also worth a look—for $699, it speeds up a Mac II by a third. That's slower than the doubling in speed you'd find in the 33MHz Siclone Si3033, but the MaraThon 030 is also a third the price of the Siclone. Mac SE/30 owners can also purchase a MaraThon 030 board, but the slight speed increase isn't worth the cost.

Owners of a Macintosh 512KE, Plus, or SE have the most choices. No 33MHz 68030-based accelerators for these Macs were available for testing at this writing, but based on the consistency of results for the 16MHz, 20MHz, and 25MHz boards we guess that these accelerators would be as fast as the 33MHz boards for the Mac II. Based on the products we did test, however, we recommend Total Systems' 25MHz 68030 Gemini board. Runners-up include the 20MHz 68030 Gemini and the Novy Quik30. MacProducts boards are reasonably priced but we found MacProducts' technical support lacking compared to the other companies.

Finally, there is hope for Mac 128K owners. Both Total Systems and MacProducts offer 68030 accelerators running at a range of clock speeds from 16MHz to 33MHz. Again, we prefer Total Systems' technical support, but the MacProducts offerings are a bit cheaper. No matter what you choose, however, now's the time to update your Mac. M

See *Where to Buy* for contact information.


M

They slice, they dice, they spool, they compress. Macintosh utilities can help you get organized.

AN EXERCISE IN UTILITIES

BY ERFERT FENTON

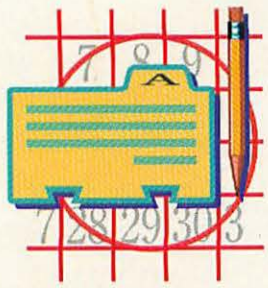
You've read about compulsive collectors. People whose houses are condemned by the health department and cleaned out by horrified sanitation workers who marvel at stacks of newspapers dating back to 1953, massive piles of fast-food containers, collections of 37,000 rubber bands, rats the size of cocker spaniels. Well, after a recent deluge of deadlines, my office was a candidate for such a story. I'm happy to report that the fast-food containers and rubber-band collections were minimal—my vice is collecting information.

So I decided to do something about it. Armed with several jumbo trash bags and dozens of manila folders, I reduced the clutter to a manageable level. Then it was time to attack the clutter that made my hard disk the digital equivalent of my office. I was beyond the help of the Clean Up command. I needed some serious organizational help. This was a job for utilities.

Macintosh utilities are programs that make a variety of computing tasks easier and/or faster. They are often desk accessories that can be called up while you're working in another application. They can also be INITs, which are activated when you turn on the Mac; cdevs, which you adjust in the Control Panel; or even stand-alone programs that you run when necessary. There are hundreds of utilities available from software vendors, user groups, and online services; it would be impossible to cover them all in a single article. Therefore, for the purposes of this article I've focused on utilities that can help you manage disk-based information more efficiently, whether you're finding, opening, storing, or printing it.

To come up with the utilities described here, I polled a group of *Macworld* editors and contributors, power users, and even a few wimpy users to see which utilities they use the most. After trying out some 40 utilities, I held on to a core collection of half a dozen that I now can't live without.

ILLUSTRATIONS BY STEVE LYONS



CLERICAL

Being a lowly computer writer, I don't have the luxury of a personal secretary. My Mac's screen, like many I've seen, is framed by a cheerful yellow border of Post-it notes, which are filled with appointment reminders, phone numbers, you name it. My first mandate in the organization campaign was, "Away with all Post-its!" Step one was to install QuickDex.

■ **QUICKDEX (CASADY & GREENE, $60)** This DA lets you place an address-and-phone-number list on a set of on-disk cards. Type in a keyword and QuickDex finds the entry for you. An autodial feature lets you dial a number with the click of a button. Although it took me a while to transfer my phone list to QuickDex, the convenience of having all that info instantly available was well worth the effort.

Options: Other similar utilities include Address Book and Rolodesk.

■ **SMART ALARMS WITH APPOINTMENT DIARY (JAM SOFTWARE; $99, $198 MULTIUSER VERSION)** Once I got the "who, what, and where" portion of my organization project in place with QuickDex, it was time to tackle "when." How? With Smart Alarms with Appointment Diary, a desk accessory duo that not only lets you record appointments, but reminds you of them as well. For example, if you've got a meeting at 8 a.m. on Wednesday, you can place a note in Appointment Diary's calendar and instruct Smart Alarms to display a reminder message on Tuesday afternoon.

Options: PowerMenus, which is described in the "Miscellaneous" section, and Now Utilities, described in "This Just In," also include a reminder feature. DiskTools Plus, mentioned in the next section, includes a calendar utility. Alarming Events, forthcoming from CE Software, provides a calendar and reminder DA, while PMC Telesystems' Rendezvous offers an appointment-diary application.



NAVIGATION

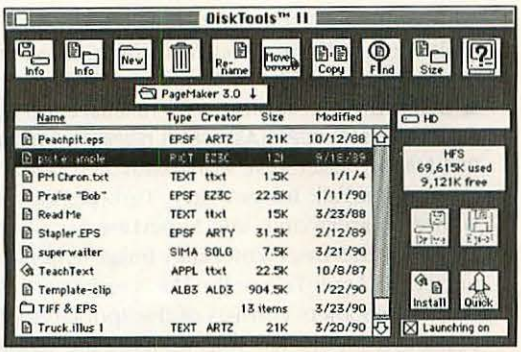
After I got my calendar and address book in order, it was time to start filing. I backed up crucial files, arranged my digital documents in folders, and gave the Empty Trash command a workout. Even so, I still have almost 60 megs of data on my 80MB hard disk. How am I going to find programs and documents that are in folders inside of folders inside of folders? One solution is Apple's trusty Find File desk accessory. I can type all or part of a file's name and have Find File tell me the file's location. Once I find the documents I need, Apple's MultiFinder helps me get from one to another, allowing me to zip among a set of open documents by clicking on an icon. These utilities work well, and since they're included with the Mac's system software, the price is right. But a number of commercial and shareware utilities improve on Apple's freebies.

■ **SHORTCUT (ALADDIN SYSTEMS, $79.95); FINDSWELL (WORKING SOFTWARE, $59.95); BOOMERANG (SHAREWARE, $30)** Each of these INITs adds a pull-down menu to an application's Standard File dialog box—the box that appears when you choose Open from the File menu or save a document for the first time. Without such a utility, you often have to double-click your way through a tangle of drives, folders, and files to locate documents you want to open or place documents you want to save. With Shortcut, Findswell, or Boomerang installed, you can list frequently used documents or folders and quickly open them from within an application. You can also find files by name or create new folders and place documents in them.

Shortcut, Findswell, and Boomerang are fine for locating and opening documents that can be opened by the application you're running, but what if you want to open a document created with another program? Fortunately, several Mac utilities allow you to launch program after program without setting foot in the Finder.

■ **ON CUE (ICOM SIMULATIONS, $59.95)** On Cue is a simple utility, but one that I quickly found indispensable. It lets you create a menu that lists frequently used applications, saving you the trouble of finding the correct folder, opening it, and then opening the application. In addition, you can create a submenu for each application that lists documents created with that application. Therefore, if you're working on several reports, you can have them all conveniently listed under your word processor in the On Cue menu. As if that's not enough, On Cue lets you launch one application directly from another, saving you the bother of schlepping back to the desktop. (MultiFinder performs this function too, but On Cue facilitates application switching under MultiFinder by listing the applications currently in use at the top of its menu.)

■ **DISKTOP (CE SOFTWARE, $99.95); DISKTOOLS II (INCLUDED WITH DISKTOOLS PLUS, ELECTRONIC ARTS, $49.95)** DiskTop and DiskTools II provide the functionality of the Finder from within a desk accessory. While you're working in any program, you can use these utilities to copy, rename, move, or delete files and folders. You can also select a file and see its type, creator, size, and date last modified, or search all or part of a hard disk for files by specifying any of these criteria. Like On Cue, DiskTop and DiskTools II enable you to launch one application or document directly from another.



The Desktop in a DA **Why make a trip to the desktop if you don't have to? DiskTools II offers many Finder functions in a desk accessory. This utility lets you find, rename, move, or delete files while you're working in an application.**

■ **POWERSTATION (FIFTH GENERATION SYSTEMS, $59.95)** This venerable utility replaces the Finder with a control panel full of buttons. You place an application's name on each button, and add a list of documents to the application if you wish. Alternatively, you can dedicate a button to a single document or a group of frequently used documents. Unlike other navigators, PowerStation lets you add desk accessories as well as applications and documents. (This may seem like a minor point, but my Apple menu is much longer than my Mac's screen, and I have to scroll a long way to get to Timbuktu.)

■ **POWERICONS (MAGIC SOFTWARE, $79.95)** PowerIcons offers a unique approach to finding and opening often-used files. This utility creates icons that look like applications, but are really only shells that take on some of the characteristics of the real applications. Rather than opening an application from within a folder that also contains companion files (for example, Prefs), you can place icons that look like MacWrite, PageMaker, and so on right on the desktop, and double-click on them to open the applications they represent. You can also attach frequently used documents to PowerIcons, as well as print a group of documents that are in different locations on a hard disk.

Options: Eureka, a DA from Personal Computer Peripherals Corporation, is a good, inexpensive file finder. A new version of On Cue will offer capabilities similar to those of DiskTop and DiskTools II.



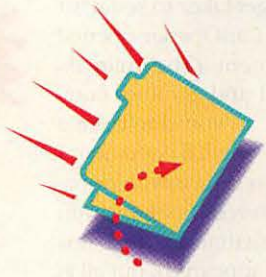
TEXT FINDERS

Despite my brave attempts at organization, I still have been known to misplace documents from time to time. While some of the navigation utilities just described above can locate files by name, a part of the name, or even creator or creation date, I'm out of luck if I can't remember any of the above. That's where text finders come in.

■ **GOFER (MICROLYTICS, $79.95; ALSO INCLUDED WITH CE SOFTWARE'S DISKTOP, $49.95)** Let's say you need to refer to a letter you wrote the mayor sometime last year about the toxic waste dump the city was planning to locate near your house. Unfortunately, the letter isn't in your Letters folder, and you can't remember what you called it. No problem. Simply select the Gofer DA, type in **toxic**, and wait for it to tell you the locations of all documents that contain that word. Gofer can even show you the text of the document so you can make sure it's the right one. If you wish, you can select a block of text and paste it into another document. If you frequently misplace files, Gofer is a godsend.

■ **ON LOCATION (ON TECHNOLOGY, $129.95)** Although it's a lot more expensive than Gofer, On Location is also a lot faster. This text-finding DA creates an index of everything you type, and stores the index in a compressed format. This method makes for lightning-fast searches of an entire hard disk. When you first install On Location, you ask it to create an index of your hard disk. On Location keeps the index up-to-date while you work. As with Gofer, you can view files and copy and paste text from them.

Options: Sonar, a text finder from Virginia Systems, is a stand-alone application, not a DA. CanOpener, which is described in the following section, can also search a disk or folder for a text string. MarcoPolo, coming soon from Mainstay, lets you search for a file by name, date, or content.

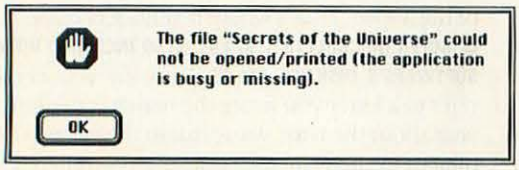


FILE OPENERS

Although electronic documents have their advantages, they're not as easy to share as paper ones. Several utilities can help break the file-format barrier, allowing you to open documents even if you don't have the application that created them.

■ **SUPERGLUE II (SOLUTIONS, $119.95); OPEN IT (TENPOINTO, $89.95)** These clever utilities take a "snapshot" of a document and save it in a form that can be opened, viewed, and printed without the application that created the document. Let's say that you've created a flyer in PageMaker and want to send it by modem to a colleague who doesn't have PageMaker. With SuperGlue II or Open It installed, you open the Chooser and select the utility instead of a printer, choose Print from the application's file menu, and wait while the image prints to disk. Then send the snapshot and a copy of the utility's viewer, and your colleague can open and print a document that looks just like the PageMaker original.

■ **HANDOFF (SOFTWARE INNOVATIONS, $49.95)** Almost



Has This Ever Happened to You? If you see this dialog box, don't despair. Even if you don't have the proper application, you may be able to open the file with one of these utilities: HandOff, CanOpener, SuperGlue II, or Open It.

every Mac user has seen the following Finder message: "The file *'name of document'* could not be opened/printed (the application is busy or missing)." If the parent application is missing, sometimes you can open a file with another application. For example, Microsoft Word can open MacWrite documents, FreeHand can open Illustrator documents, and most paint programs can open MacPaint documents. A cdev called HandOff lets you select a substitute application—if it's compatible—to open the document from the desktop. (The forthcoming HandOff II will offer a pop-up menu that, like the navigators described earlier, lets you launch documents and applications.)

■ **CANOPENER (ABBOTT SYSTEMS, $125)** There's yet another way to open a file if you don't have the application that created it: use CanOpener. This incredible utility—which comes in application and DA formats—can open virtually any document, even if the original application's not around. And unlike HandOff, CanOpener doesn't need a compatible application to do it. This sounded too good to be true, so I threw away PageMaker to see what would happen. Sure enough, CanOpener opened a multipage PageMaker document. (The utility divides documents into the text and graphics components that make them up, so you don't see a page that looks exactly like the original document.) Once you've opened a file, you can copy information or print the file. I encountered problems with some MacWrite and Word documents (text was missing or garbage characters appeared), but all in all I found CanOpener an impressive utility.



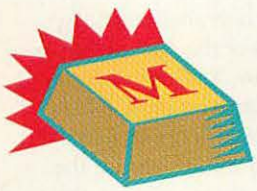
PRINTING AIDS

There's no sense sitting at the computer watching a dialog box tell you a file's being printed, when you could be using that time doing productive work and keeping the American economy afloat (or perhaps playing a game of Crystal Quest). That's where print spoolers come in handy. These utilities store documents on disk and send them to a printer when it's available. MultiFinder provides background printing to PostScript printers with Apple's PrintMonitor, but if you don't use MultiFinder or have a non-PostScript printer, other options are available.

■ **LASERSERVE (INFOSPHERE, $95); TURBOSPOOL (PERIPHERAL LAND, $69); SUPERLASERSPOOL (SUPERMAC TECHNOLOGY, $149.95)** LaserServe works with the LaserWriter or an AppleTalk ImageWriter, TurboSpool works with the LaserWriter, and SuperLaserSpool operates with the LaserWriter and ImageWriters connected via AppleTalk or the Mac's serial port. Each of these spoolers consists of the spooler application and a DA that lets you configure the spooler.

■ **LASERSTATUS (PART OF MOCKPACKAGE PLUS UTILITIES, CE SOFTWARE, $49.95)** When you send a document to the LaserWriter, you don't know what's going on in there. LaserStatus can help. If you're trying to print a memo on a networked LaserWriter at work and it seems to be taking forever, LaserStatus can tell you who's using the printer. LaserStatus can also show you what fonts reside in the printer and how much memory is available. You can also use LaserStatus to manually download fonts to the LaserWriter from within an application, or to reset the printer. Widgets, a set of utilities included with MockPackage, lets you turn off the test page that the LaserWriter spits out every time you turn it on.

Options: Additional print spoolers include SuperMac Technology's SuperSpool (ImageWriter), Mainstay's MacSpool (ImageWriter), and Orange Micro's Grappler Spooler (ImageWriter).



MACROS

Apple's MacroMaker lets you record keystrokes, menu commands, and mouse movements to create macro commands that are available at the press of a keystroke combo. As usual, Apple's utility is adequate—and free—but more sophisticated alternatives are available.

■ **TEMPO II (AFFINITY MICROSYSTEMS, $149.95)** Like MacroMaker, Tempo II is an INIT that adds its own menu to the menu bar. You choose Start Recording, perform the actions you want to record, then select Stop Recording and assign a keystroke sequence to the macro. Although Tempo II sounds quite similar to Apple's utility, it's actually more versatile. For example, you can have a certain amount of time elapse between steps in a macro, or record the path the mouse takes. An add-on package called Tempo+ Tools lets you place macros in a menu, print the contents of macros, run Tempo+ Externals (programs that work outside of Tempo II), and run Tempo II macros from HyperCard or Excel.

■ **QUICKEYS (CE SOFTWARE, $99.95)** QuicKeys takes a different approach than MacroMaker and Tempo

II. This cdev presents a menu of individual macros that can be chained together if you wish, or edited to meet your needs. Stringing together series of commands and mouse movements isn't QuicKeys' forte, but this utility provides an excellent set of macros that do things like insert a line of text, type the date and time, move from one page or column to another, open windows, select tools or menu items, restart the Mac, bring up the Standard File dialog box, and so on. One of my favorite QuicKeys keystrokes types opening and closing quotation marks (after all these years, I still can't remember the convoluted triple-key combos required to type curly quotes).

■ **NIGHTLIFE (SIMPLE SOFTWARE, $79.95)** If you use macros to work more efficiently, the next step is to get the Mac to run them when you're not there. NightLife does just that, allowing you to set a time for a macro to kick in. You could use NightLife in conjunction with Tempo II or MacroMaker to print a set of long documents while you sleep, to activate a MicroPhone II macro that downloads your MCI mail, or to update a database in the wee hours. Although NightLife itself seems to work fine, I had to fiddle quite a bit with one of the suggested macros to get it to work.

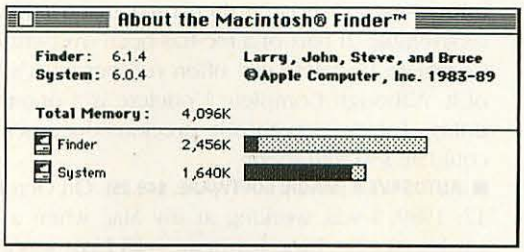
Options: QuicKeys includes QuickTimer, a utility that enables you to schedule the operation of QuicKeys macros.



DISK REPAIR AND PREVENTIVE MAINTENANCE

The army of utilities I employed in my organization campaign solved a lot of problems, but they created others. For example, the dozens of INITs I installed took up a good deal of System memory, and to make matters worse, started fighting among themselves. Also, in my well-meaning effort to clean off my hard disk, I inadvertently threw away a document I hadn't backed up. Finally, since I'd downloaded a few utilities from online bulletin boards, I was starting to worry that a virus might creep into my system. Fortunately, I had some utilities that solved the problems I'd brought on myself.

■ **HEAPFIXER (PART OF DISKTOP, CE SOFTWARE, $49.95)** HeapFixer. Sound like Tonto name this utility. But you can be in a heap of trouble if the Mac's system heap becomes too full. The system heap is the area of memory where fonts, DAs, cdevs, INITs, and various other acronyms are loaded. If you use a lot of utilities, the system heap can run short of memory, causing the Mac to work unreliably or



Info Box of Doom If the system heap becomes full, your Mac could get ornery. If you use a lot of INITs, you might want to use HeapFixer to add more System memory.

even crash. To see if you're a candidate for HeapFixer, select About the Finder from the Apple menu and look at the bar labeled "System." The dark part of the bar indicates how much memory is being used; if the dark stripe takes up more than 75 percent of the bar, there may be memory trouble brewing. (Yikes! I just looked at my System's memory bar, which had only a one-pixel-wide bar of white space left. You can bet I used HeapFixer right away to allot more memory to my Mac's system heap.)

■ **AASK (PART OF MOCKPACKAGE PLUS UTILITIES, CE SOFTWARE, $49)** I knew I was on my way to power-user-hood when my Mac displayed two rows of INIT icons on start-up. But INITs eat up memory, and they don't always get along with each other. You can temporarily disable INITs by holding down the Shift key as you start the Mac, but that puts all INITs to sleep. Some INITs let you turn them on and off from the Control Panel, but others don't. Aask lets you turn selected INITs on and off at will.

■ **1STAID KIT (1STAID SOFTWARE, $99.95); SUM II (SYMANTEC, $149)** If your hard disk crashes, you have two alternatives: (1) slash your wrists immediately, or (2) try to recover your files. If you opt for the latter approach, you might consider a disk-and-file-recovery utility like 1stAid Kit or SUM II. These utilities help you diagnose and—with any luck—repair damaged disks or documents. 1stAid Kit's mammoth manual explains probable causes and possible solutions for many Mac ills. 1stAid Kit's manual is the diagnostician; the software is the surgeon, performing operations such as rebuilding a volume directory or recovering a damaged file. SUM II consists of components that let you back up a hard disk, diagnose hard disk maladies and recover files, optimize a hard disk's performance by defragmenting files, divide a hard disk into separate volumes, and protect files from unauthorized access. Although I didn't crash my hard disk in the name of Science, I did successfully resurrect a trashed document with SUM II.

■ **COMPLETE UNDELETE (1STAID SOFTWARE, $49.95)** If SUM II taxes your software budget, you might consider Complete Undelete, a utility that recovers lost files. This INIT keeps track of the files you

throw away and recovers them on demand if they're recoverable. If part of a file has been overwritten, Complete Undelete can often recover what's left of it. Although Complete Undelete is a one-trick utility, if it saves even one precious document it could be $50 well spent.

■ **AUTOSAVE II (MAGIC SOFTWARE, $49.95)** On October 17, 1989, I was working at my Mac when a 7.1 earthquake hit. I was fortunate—all I lost was a lot of glassware and 20 minutes worth of typing (major earthquakes have a tendency to cause power outages). Even if you don't live in earthquake territory, it's a good idea to save your files frequently. If you tend to be a little forgetful, I'd recommend AutoSave II, a cdev that automatically saves documents for you at any time interval you set.

■ **VACCINE (INCLUDED WITH CE SOFTWARE'S DISKTOP, MOCKPACKAGE PLUS UTILITIES, $49.95, AND QUICKEYS, $99.95)** Vaccine is a cdev that scans files for viruses. If you frequent service bureaus, user groups, online bulletin boards, or any other possible sources of electronic infection, you'd be wise to install a virus detector.

Options: Peter Norton Computing's Norton Utilities for the Macintosh and Central Point Software's MacTools Deluxe should be available by the time you read this (see "This Just In"). ALSoft's DiskExpress II can help optimize a hard disk's performance by automatically defragmenting the disk as you work. 1stAid Software's Sector Collector isolates bad sectors on a hard disk, preventing them from damaging files. Other Virus detectors include Mainstay's AntiToxin, Symantec's SAM, Microcom's Virex, and Apple's Virus Rx.



MISCELLANEOUS

Several companies have improved on standard Macintosh features such as the Scrapbook, Clipboard, menus, and font and DA handling. Many of these companies have outdone Apple in making the Mac's user interface versatile and easy to use.

■ **SMARTSCRAP & THE CLIPPER II (SOLUTIONS, $89.95)** The Mac's standard Scrapbook has several drawbacks. For example, you can only access one Scrapbook file at a time, the window size is limited, and you have to cut or copy an entire window at a time. SmartScrap takes care of all these shortcomings and more. You can create as many SmartScrap files as you like, selecting among them by name; the SmartScrap window is resizable and scrollable; you can copy part of a graphic or a selected block of text; and you can assign a name to each SmartScrap page to help you find it later. And unlike Apple's Scrapbook, SmartScrap lets you print its images directly. SmartScrap's companion DA, The Clipper, lets you trim or scale an image before pasting it and allows you to see the contents of the Clipboard even in applications with no Show Clipboard command.

■ **MULTICLIP (OLDUVAI CORPORATION, $129)** While SmartScrap lets you create multiple Scrapbooks, MultiClip—as the astute reader will no doubt guess—allows you to create multiple Clipboards. While Apple's Clipboard lets you store only one item at a time, MultiClip (see *Reviews* in this issue) lets you add numerous items without erasing the previous contents. In this respect MultiClip is more like the Scrapbook than the Clipboard, but MultiClip offers one advantage over the Scrapbook: an image is automatically added to MultiClip when it's cut or copied, whereas you must open the Scrapbook to paste in an image.

■ **SUITCASE II (FIFTH GENERATION SYSTEMS, $79) AND MASTERJUGGLER (ALSOFT, $89.95)** Both of these utilities allow you to get around the Mac's limit of 15 desk accessories and install dozens of DAs in the Apple menu. They also let you selectively open suitcases full of screen fonts, saving you the trouble—and disk space—of installing multiple font sizes and styles in the Mac's System file. Both programs provide font-compression and resource-editing utilities as well. MasterJuggler lets you work with digitized sounds in addition to fonts and DAs. If you use a lot of fonts and/or desk accessories, you'll love these utilities.

■ **POWERMENUS (MAGIC SOFTWARE, $79.95)** The mouse is a great invention. But if your Mac has a large screen, you can get tired of the long journey up to the menu bar and back to your document. PowerMenus saves you the trip. This INIT causes the menu bar to appear near your cursor. The menu titles appear in a vertical format, with the Apple menu on top, the File menu second, and so on. Submenus list each menu's choices. And if you're tired of scrolling down a long Apple menu, you can attach your favorite desk accessories to PowerMenus' menu.

■ **EZ-MENU (PART OF MOCKPACKAGE PLUS UTILITIES, CE SOFTWARE, $49.95)** EZ-Menu leaves the menus in place, but makes it easier to open and use them. If your index finger is getting a blister from holding down the mouse button, take heart—with EZ-Menus you don't have to touch the mouse button—or even the mouse. This utility lets you open menus with a keystroke, use the Tab key to move across the menu bar, use the arrow keys to move up and down open menus, and press Return to choose a menu item.

■ **ICON-IT (TACTIC SOFTWARE, $89)** In keeping with the spirit of the Mac interface, Icon-It lets you assign menu items, DAs, fonts, F-keys, and macros to icons. This INIT lets you add an "icon bar" to any application, placing frequently used commands

THIS JUST IN

The following utilities packages should be available by the time you read this.

NORTON UTILITIES FOR THE MACINTOSH

(Peter Norton Computing, $129)
More than a few IBM PC owners worship the ground Peter Norton walks on. His file-repair and recovery tools have saved many a file from oblivion. Now Mac owners can benefit from Norton's expertise. Norton Utilities for the Macintosh includes utilities for disk repair, recovery of damaged or deleted files, disk space optimization, and recovery of accidentally erased hard disks. Norton Utilities also offers DAs that locate and open documents; display keystrokes to access the extended character set; and add move, copy, and delete to the Standard File dialog box.

MACTOOLS DELUXE

(Central Point Software, $129)
The MacTools package offers utilities that locate files, recover files or disks, repair damaged files, back up hard disks, encrypt files, and optimize hard disk space.

NOW UTILITIES

(Now Software, $149)
This utility potpourri offers many of the functions of the utilities described in this article, including an appointment alarm, a Standard File dialog box menu, a memory-adjustment utility, a menu bar that pops up at the cursor's location, and a utility that lets you turn selected INITs on and off (see *Reviews* in this issue). Also offered are utilities that let you preview a page before printing it, change the desktop pattern, and display different font styles and sizes in menus.

QUICKTOOLS

(Casady & Greene)
This utility collection provides an assortment of screen savers, an icon-based file navigator, a screen-capture utility, an F-key utility, and a dialog box enhancer.

where you can reach them quickly. Icon-It comes with a number of predesigned icons and icon bars, but I prefer to use the program's icon editor to create my own.

■ **STUFFIT AND STUFFIT CLASSIC (SHAREWARE, $20; ALADDIN SYSTEMS, $25)** StuffIt can save you space, time, and money—what more could you want? This file-compression utility squeezes a single file or a group of files into as little disk space as possible. You can use StuffIt to whittle down the size of files stored on a hard disk, or to compress files for transfer to floppies. And if you're uploading or downloading files by modem, StuffIt cuts down your time online, saving you phone charges and connect fees. The original StuffIt is now called StuffIt Classic and is available as shareware from Aladdin Systems ($25). An enhanced version, StuffIt Deluxe ($99.95) should be shipping by the time you read this. Besides including a Magic Menu available from the Finder, StuffIt Deluxe will include new compression schemes that are faster and will offer JPEG compression for color graphics.

SOME OF MY FAVES

After trying out all the utilities described here, I found myself using about half a dozen on a daily basis. To accommodate the large number of fonts and desk accessories I've acquired, I use Suitcase II (MasterJuggler is also an excellent font/DA extender). When I need to call someone, I put QuickDex to work; I summon the desk accessory (with a Tempo II macro), type the name I need, then hold my phone to the Mac's speaker while QuickDex dials the number (this looks sort of silly, but it works). To mosey from one application to another, I use On Cue. I like its simplicity, although I sometimes use the more sophisticated DiskTop or DiskTools II to locate files. As I type, I have QuicKeys type open and close quotes for me, instead of those unsightly straight quotes. AutoSave II dutifully saves my work every five minutes. When I'm ready to print my documents, I send them to the printer via SuperLaserSpool.

In addition to these daily helpers, I find myself using other utilities when the need arises. I wouldn't think of sending a large file by modem without first compressing it with StuffIt, or receiving a strange file without having Vaccine check it out. When I need to store text or graphics, I paste them into SmartScrap. On those rare—but annoying—occasions when I lose a file in a maze of folders, On Location saves the day. And on those rare—but traumatic—occasions when I *lose* a file due to software crashing or accidental trashing, I employ SUM II. Thanks to utilities, my computing life has become safer, more productive, and yes, more organized. M

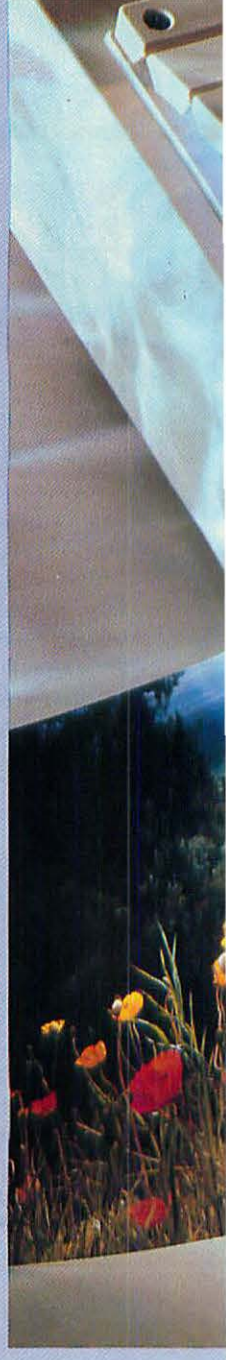
See *Where to Buy* for contact information.

***Erfert Fenton** is a* Macworld *contributing editor and coauthor of* Canned Art: Clip Art for the Macintosh *(Peachpit Press, 1990).*

COLOR SCANNERS

Pick from a Growing Field

Whether you just want to nab screen images or you need precision color for publication, there's a color scanner for your purpose



BY JOHN RONGA AND LUTHER SPERBERG

If desktop publishing has traditionally set the pace for innovation on the Mac, color now sets the pace for desktop publishing. But until today's faster, more color-capable Macintoshes appeared, truly able to handle the immense size of color-image files, talk of a bona fide desktop machine for publishing and multimedia was strictly hypothetical—and the demand for color scanners minimal.

Hand-in-hand with the new Macs have come new developments in color scanning, today one of the fastest-moving fields in computerdom. From 4 hardware manufacturers offering 9 scanners last year, there are now 10 vendors with more than 20 color scanners—a machine for every budget and need. Moreover, two major-league color editing programs, ColorStudio and Photoshop, have appeared that operate the scanners as well as operating on the im-

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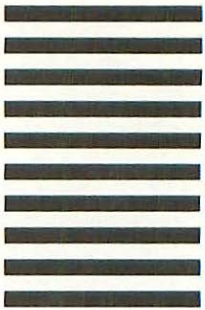
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PHOTOGRAPHS BY PIERRE-YVES GOAVEC

ages themselves, greatly enhancing the viability of desktop color.

People use color scanners in a variety of applications, and whether you produce video, slide presentations, multimedia entertainment, color comps, or color separations for publication in large part determines what type of scanner you should have. Another factor is the type of source image you typically use—prints, slides, or large-format transparencies. At present, the two most popular scanner formats are slide scanners and flatbeds. As this article was prepared, a number of scanners based on newer designs were announced or released; most weren't available for review, but a number are described in "Scanning the Horizon." Some of the new models are a cross between the current types of scanners and a mini–video camera. Some of them are inexpensive, 8-bit hand-held units. At least one scans with a depth of field of 2 inches. And in the not-too-distant future, you can look for drum scanners similar to those used in half-million-dollar scanning systems.

Slide Scanners

As the name implies, slide scanners work with 35mm slides (or film negatives). Because the photography market works with transparencies, slide scanners make up the high end of the desktop-scanner markets—high as in high resolution (up to 4300 lines per inch), high quality, and high prices. Slide and transparency scanners inherently produce better images than reflective scanners because transmitted light provides a greater dynamic range and more shadow and highlight detail than light bouncing off a print does.

SCANNING THE HORIZON

Several new and noteworthy scanners were unavailable for full evaluation when we were preparing this article.

Truvel TZ-3BWC Truvel has a 24-bit, 900-dpi overhead flatbed scanner that enables you to scan flat art or objects up to 2 inches in height. The unit looks like a camera mounted above a copy stand (see photo). The documentation that comes with the scanner is some of the best we've seen. It not only gives good directions on setup and use but also provides useful theory.

The Truvel's lights require about 15 minutes to warm up, and then you have to calibrate the unit. Unless you want to leave the scanner on all day, you must repeat this procedure before each scanning session.

With the proper interface, the TZ-3BWC will connect not only to Macintoshes but also to IBM PCs, their compatibles, and Apollo computers. Two interesting options are available with the scanner. One item is an image buffer that comes as a base for the scanner and contains either a 45MB removable drive or a 100MB fixed drive. The other available addition is Truvel's Zebra board, which enhances line-art scans. If line art is a major part of the work that you do, this might be worth looking into. The basic scanner is $11,685, with the software. A fully configured Truvel TZ-3BWC with the 45MB removable base, SCSI adapters, and Zebra board runs about $19,500.

CIS 4520 The people that brought you the original Barneyscan have gone back to the drawing board and come up with a scanner with 12 bits per color channel that handles transparencies of up to 4 by 5 inches. This SCSI-based scanner has an Intel 80386SX processor to provide fully automated background scanning and a Motorola 56001 Digital Signal Processor that speeds up operations like brightness-and-contrast correction, image resizing, and light-source compensation. The 4520 comes with the same easy-to-use QuickScan and Barneyscan XP software as the CIS 3510 model. While we have only seen a demo of this scanner, it seems promising and is designed for industrial-strength use. The specifications and $27,000 price tag make this machine a candidate for heavy production or a service bureau.

La Cie Silverscanner From the people who brought out the Tsunami hard drives comes a 300-dpi, 8.5-by-11.7-inch scanner complete with its own image-capture software. The most significant feature about this SCSI-based scanner is its $1499.95 list price. In the low-end, 24-bit flatbed market, Microtek is finally getting some competition.

Sharp JX 600 With the introduction of the 600-dpi scanner and an improved transparency option that uses a light source above the image rather than a mirror assembly like the earlier model, the flatbed has to be reexamined as a prepress tool, since it can now handle both reflective and transparent art. This improved transparency attachment is included in the price of the scanner.

Asuka NuScan and NCL America ClearScan Asuka Technologies and NCL have a marketing relationship similar to that of Sharp and Howtek, with Asuka playing the role of original manufacturer. Both companies recently introduced 8-bit color hand-held scanners, the Asuka NuScan Color and the NCL ClearScan 300 MCO. There are several unique features about these scanners. First, with the Asuka version you have a choice of either a SCSI or GPIB interface (we'd go for the GPIB), and second, both have the ability to join three 2½-by-5-inch scans into one image via software. This join operation is fairly easy to do, especially if there are some vertical lines in the images. The actual scan takes about five to seven seconds. As you roll the scanner down a section of the source image, the scanned strip immediately appears on the screen. Both scanners come complete with software that captures images and joins up to three segments. The maximum scan area is actually about 7 inches wide and 5 inches long, since you have to allow for the overlap to join the segments. Both units sell for about $600.

XRS 3c The XRS Corporation has taken a Microtek MSF-300Z scanner and modified it to handle transparencies. The sleek, black XRS 3c looks like equipment for a stealth bomber, but it carries a list price of only $4500. If you already have a Microtek MSF-300Z scanner, XRS will upgrade your present scanner with the transparency modification. What basically happens is that the shell of the scanner is replaced with a black case that has a slot cut out on the left side to accept the light source for transparencies. Like the Microtek unit it comes bundled with SuperPaint, Digital Darkroom, and PhotoMac Edit.

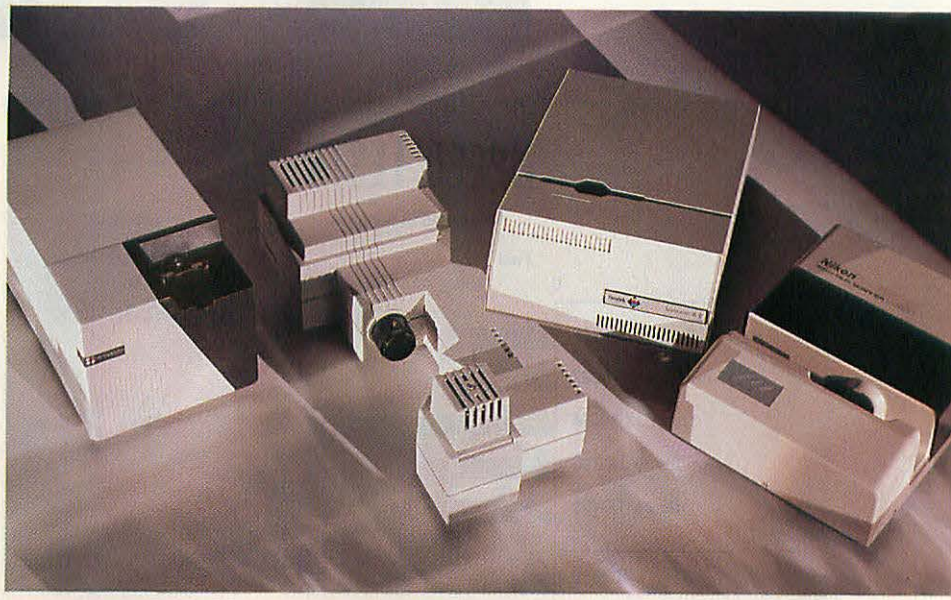
Optronics ColorGetter This rotating-drum scanner works like scanners on high-end color prepress systems. It can scan both flat art and transparencies from 35mm to 10 by 10 inches. The ColorGetter's 12-bits-per-channel, drum technology should have an edge over the more conventional Mac flatbed and slide scanners, but this kind of technology doesn't come cheap. The scanner, with its 80286 Wyse controller and Color Access software, will cost you about $65,000. Optronics expects the ColorGetter to be ready for late summer delivery.

Howtek Scanmaster 3 By the time you read this, Howtek should be selling a 400-dpi, 12-bits-per-channel scanner that will handle both flat art and transparencies. This scanner works much like the 300-dpi XRS unit: you plug in an overhead light source to scan transparencies. This is the first flatbed scanner that Howtek has built itself, and the design differences from the Sharp units are major. It is a large desktop unit and, unlike the Scanmaster, the platen doesn't move; the scanning mechanism moves internally.

The quality of the best desktop units have come a long way. While they still have a long way to go to come up to the level of traditional high-end systems such as Scitex, Hell Graphics, or Crosfield, it is definitely possible to use desktop units for the demanding application of print separations. We don't recommend desktop scans for publications in which color fidelity is critical, but many publishers today are using Mac scanning and separation technology to gain more control over the publishing process and—as their knowledge and experience grow—to save money.

While most slide scanners fall into a tight price range, from about $8000 to $11,000, their features differ significantly. In our opinion, the most impressive of the lot is the Nikon.

Nikon LS-3500 Like its 35mm cameras, Nikon's foray into scanner technology is an easy-to-use, sturdy piece of equipment. The Nikon LS-3500 slide scanner is a 24-bit, autofocus, self-calibrating unit that requires a GPIB (General Peripheral Interface Bus) interface. This is an interface standard that's used in the majority of the scanners reviewed.



The available slide options when this article was written (starting from the left): the CIS 3510, the Eikonix 1435, Howtek's Scanmaster 35 II, and the Nikon LS 3500.

In creating the LS-3500, Nikon paid close attention to detail. For example, the unit comes with five different carriers for different types of slide mounts, and the manual goes into detail about which carrier to use with which mount. The advantage of this setup is that the slide is always in sharp focus, no matter how thick the mount.

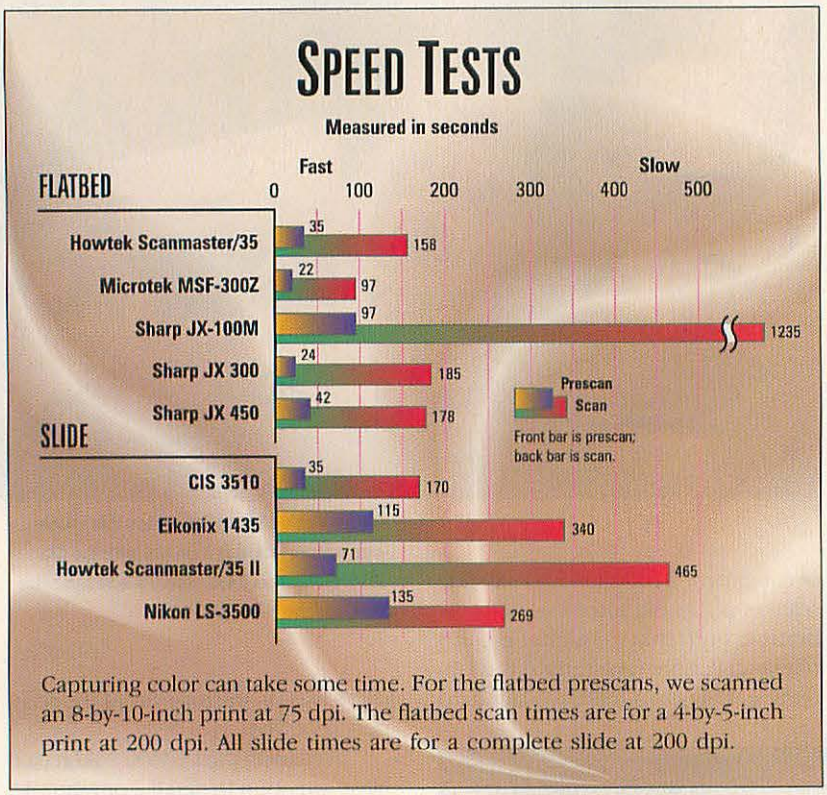
Nikon sells the $750 Colorflex software separately, and we found it to be a satisfactory image-capture application. In addition, Colorflex addresses most color-correction needs. It contains several features that allow for testing and automatic calibration of the scanner that are handy to have around and that you will not find in other software. If you need the image-manipulation filter, masking, or extensive retouching abilities, you should consider buying either Photoshop or ColorStudio in addition to Colorflex.

The Nikon LS-3500 user manual includes a succinct introduction on setup, scanner features, and operation; from there it gets technical fast—too fast for most users. The lack of a good primer on digital color is the one area we feel Nikon scants in its otherwise well-thought-out scanner. In general, the Nikon provides the best scans with the least effort on the scanner's part. This is a machine one can really enjoy working with.

SCANNER HARDWARE

Product	Interface	Resolution (in dpi)	Scanning Area	Transparency Attachment	Software Included	Price
FLATBED SCANNERS						
Howtek Scanmaster	GPIB	300	11" x 17"	$649 extra	yes	$8195
Howtek Scanmaster II	GPIB	300	8.5" x 11"	no	yes	$6195
Howtek Scanmaster 3[1]	GPIB	400	11" x 17"	included	yes	$9395
La Cie Silverscanner[1]	SCSI	300	8.5" x 11.7"	no	yes	$1799
Microtek MSF-300Z	SCSI	300	8.5" x 14"	no	yes	$2695
Sharp JX-100M	serial	200	4" x 6.5"	no	yes	$995
Sharp JX 300	GPIB[2]	300	8.5" x 11"	no	yes	$2995
Sharp JX 450	GPIB[2]	300	11" x 17"	$450 extra	yes	$6995
Sharp JX 600[1]	GPIB[2]	600	11" x 17"	included	yes	$14,995
XCR Corporation XRS 3c[1]	SCSI	300	8.5" x 14"	included	yes	$4500
SLIDE SCANNERS						
CIS 3510	custom	1024	24mm x 36mm	NA	yes	$9495
CIS 4520[1]	SCSI	2000	4" x 5"	NA	yes	$27,995
Eikonix 1435	GPIB[2]	3000	24mm x 36mm	NA	no	$9900[3]
Howtek Scanmaster/35	GPIB	2000 x 1333	24mm x 36mm	NA	yes	$6995
Howtek Scanmaster/35 II	GPIB	2000	24mm x 36mm	NA	yes	$6995
Nikon LS-3500	GPIB[2]	4096	24mm x 36mm	NA	no	$9995[3]
Pre-Press Spectre5000[1]	GPIB	1250	4" x 5"	NA	yes	$30,000
OVERHEAD SCANNERS						
Truvel TZ-3BWC	SCSI	900	11" x 17"	no	yes	$11,685
HAND SCANNERS (8-BIT)						
Asuka Technologies	GBIP	300	2.5" x 5"	no	yes	$695
NuScan Color	or SCSI					
NCL America	SCSI	300	2.5" x 5"	no	yes	$795
ClearScan 300, MCO						

[1]Prerelease at time of writing; specifications and price subject to change. [2]GPIB not included in base price. [3]Scanning software not included in price.



Capturing color can take some time. For the flatbed prescans, we scanned an 8-by-10-inch print at 75 dpi. The flatbed scan times are for a 4-by-5-inch print at 200 dpi. All slide times are for a complete slide at 200 dpi.

CIS 3510 This unit was our second favorite in the slide-scanner category. Unlike Nikon, which forces you to buy the scanner software and a GPIB board separately, Color Imaging Systems (CIS), formerly Barneyscan, includes everything you need to start using the 3510 right out of the box: hardware, excellent software, and an interface board. Instead of the GPIB board, CIS decided to go the independent route and come up with its own board. This facilitates installation and setup, since the board comes already configured for the scanner.

While the 3510 gets high marks for setup, using it is not quite as convenient as using the Nikon. You must run a configuration test when you initially set up the 3510, and you should run focus tests whenever you first turn it on. While these tests take only a few minutes, the testing software is a bit disconcerting to use, always leaving you with the feeling that you could have gotten the focus a bit sharper.

The software that comes with the scanner, CIS XP, is an early, pre-Adobe version of Photoshop. While the final Photoshop release is much more polished and includes many more features, CIS XP is without question the best of the bundled scanner packages. It not only captures and color-corrects an image, it also allows for a fair amount of retouching. The documentation that comes with the software is excellent.

The CIS 3510 is a lower-resolution scanner than the Nikon. It's well suited for comp and video production since its scanning times are fast, but the unit lacks the resolution necessary for serious separation work with images that will be enlarged a great deal. If the majority of your enlargements are smaller than, say, 5 by 7 inches, the CIS 3510 comes close to the Nikon in quality. The question comes down to what is more important to you: an edge in quality and convenience or saving $2000 to $3000.

As this went to press, CIS announced that it had upgraded the 3510 with an improved lens. The improved unit, dubbed 3515, is supposed to produce brighter, sharper images; 3510 owners can receive the upgrade for $695.

Howtek Scanmaster/35 II The Scanmaster/35 II is a high-resolution scanner (2000 dpi), but it has a fixed scan area, which means you must rotate the slide with software after you have scanned it. The Scanmaster/35 II was noisy to operate, and, while its prescan was the second fastest of those we tested, the machine was by far the

SCANNER SOFTWARE

Product	Software from Manufacturer	ColorStudio Driver	Photoshop Driver	SpectreScan Driver
FLATBED SCANNERS				
Howtek Scanmaster, Scanmaster II	MacScan-It 1.41	yes	no	yes
Microtek MSF-300Z*	Microtek Color	yes	no	no
Sharp JX-100M	Chromascan 100 1.1	yes	no	no
Sharp JX 300, 450, 600	Chromascan 1.1	yes	no	yes
SLIDE SCANNERS				
CIS 3510	CIS XP, Quickscan	yes	no	no
CIS 4520	CIS XP, Quickscan	N/A	no	no
Eikonix 1435	none	yes	no	yes
Howtek Scanmaster/35, /35 II	MacScan-It 1.41	yes	no	no
Nikon LS-3500	Colorflex ($750)	yes	yes	no
HAND AND				
OVERHEAD SCANNERS				
Asuka Technologies NuScan Color	Myscan 1.0	no	no	no
NCL ClearScan 300 MCO	Clearscan 1.0	no	no	no
Truvel TZ-3BWC	Truscan 4.5a	no	no	no

Also included are Digital Darkroom, SuperPaint, and PhotoMac. (Supplied drivers are as of spring 1990. Companies continually add new drivers, and the one you want may have been supplied.)

slowest of the slide units when it came to scanning (see "Speed Tests"). While the Scanmaster 35 models technically scan 12 bits of color data per channel and its resolution is almost twice that of the CIS 3510, we found little difference in quality at the size we were working with. Results should be different as you go up in magnification. The MacScan-It software is adequate, but the dialog boxes are a bit obtuse and not explained well in the scant documentation. While the scanner has been in production for a while, it still comes with a photocopied user manual that is not very informative.

As the new round of color scanners is announced, the trend appears to be a movement from 8 bits per red, green, and blue color channel (for a total of 24 bits) to 12 bits per channel. The scanner intelligence then boils down that 36 bits of information to the best-possible 24 bits. Theoretically this should enable the scanner to provide a broader spectral range, with better highlighting and shadow detail than an 8-by-3-bit scanner. In practice, the results we got from the Scanmaster/35 II indicate that 12-by-3-bit scanning is not enough by itself to produce better results.

Howtek also offers a lower-resolution Scanmaster package, the Scanmaster/35, a 2000-by-1333-dpi scanner that lets you scan a slide horizontally or vertically. Like all the Howtek products, it comes complete with GBIP board and software.

Eikonix 1435 The Eikonix scanner looks like it came out of a Steven Spielberg film, and it works a bit differently from the other slide scanners in this roundup, as well. The 1435 has a lens that you need to adjust manually for f-stop. A series of four lights on the side of the unit work like a camera's autoexposure meter; when three of the four lights are on you have a good exposure. This system works after you get a feel for it, but it's a bit clunky. The scanner does not allow for different slide mounts but compensates for this deficiency somewhat by letting you select a smaller f-stop, which lengthens scan time but increases depth of field.

The Eikonix 1435's setup is fairly straightforward, although the unit requires a separate power supply (the company couldn't fit one in that futuristic case) and is designed so that you must turn on the fan each time you turn on the scanner. The Eikonix 1435 comes with no software of its own. Eikonix recommends either SpectreScan ($1495) or ColorStudio ($1995); with either of these software products the Eikonix is the most expensive of the scanners we looked at.

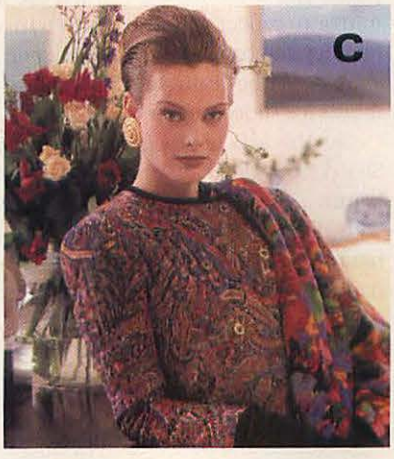
In use, the Eikonix 1435 was one of our least favorite slide scanners. In test scans, it consistently boosted magenta in images and required more correction than any other unit tested. The inconvenient manual and exposure control, and the addition of high-priced software, put this scanner at the bottom of our list.

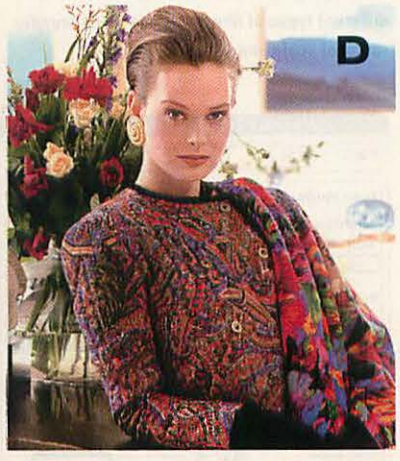
Flatbed Scanners

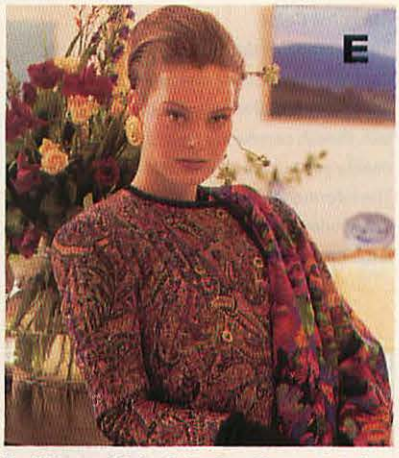
Flatbed scanners provide a way to get reflective artwork of up to 11 by 17 inches into a computer. These scanners generally work at resolutions from 300 to 600 dpi. For video or on-screen purposes, this is more than enough. For separations, it should be plenty, as long as you don't plan to blow im-









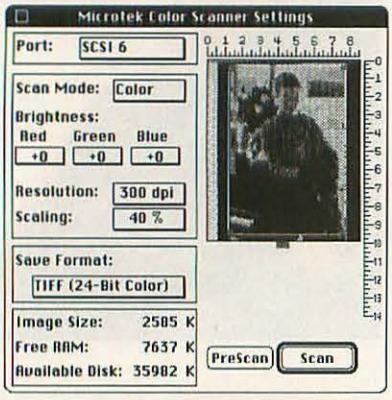


Paul Beyer of Soho Color Graphics used desktop scanners to publish all of these photos except (E). Beyer used ColorStudio to slightly adjust the color balance and sharpness of the Mac scans and to produce separations. He then output the files on a Varityper 5300 at 141 lines per inch. (A) comes from the Howtek Scanmaster/35, (B) is an Eikonix 1435 scan, (C) is a CIS 3510 separation, and (D) was produced using the Nikon LS-3500. For comparison, (E) was scanned on a Dainippon Screen DS688 scanner, color-corrected on a Scitex Presponse system, and output on a Scitex Raystar at 150 lpi.



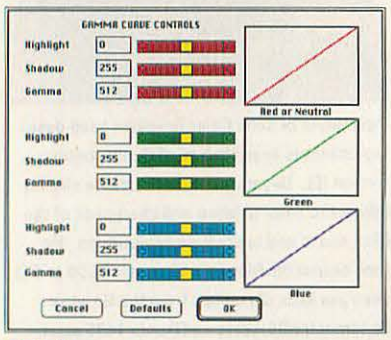
ColorStudio

Like Microtek Color, ColorStudio gives you image-size information. Since it is a more robust program, ColorStudio allows for different types of film and gives you a broader range of scale and dpi options.



Microtek Color

This is probably the most convenient of the capture programs we reviewed. As a desk accessory it is always available and is easy to use, though somewhat limited. Pop-up menus enable you to control resolution and scaling. The information in the lower left-hand corner of the window is important and if you don't have a large hard drive, very valuable.



Colorflex

Nikon's software is a good example of the kind of control you have in most of the capture programs that are available with scanners. If you want to, you can save gamma curves like these and reapply them in later scans.

ages up much beyond the size of the original (a ratio of 2:1 between scan rate and halftone lines per inch is usually recommended for best quality). As mentioned earlier, however, separations made from reflective art—while they may be fine for many publications—will not be as good as those made by scanning transparencies. Sharp and Howtek offer transparency attachments (for $450 and $650 respectively) that at least enable you to get transparencies into the computer. But these devices, which use a mirror to reflect light through a transparency and back to the scanning unit, should not be thought of as replacements for slide scanners.

As this article was going to press, Sharp released a 600-dpi scanner that features a transparency scanning unit with its own light source (see "Scanning the Horizon"). While this transparency unit will probably yield better scans than the mirrored attachments, the scanner still doesn't have the resolution necessary for working with slides at publication quality.

Sharp JX 450, Howtek Scanmaster In the 11-by-17-inch category two players are using the same scanning engine. Sharp markets its own scanners as well as making them for Howtek. The clear advantage lies with the Howtek. The 300-dpi Howtek unit comes complete with software and a preconfigured GPIB board. One of the sore points with these scanners is that the platen moves when you scan; your initial impression is that the machine is compact for a scanner capable of such a large image size, but once you start scanning, look out for nearby coffee cups. The Howtek sets up easily, and while the documentation is not great, it gets you through.

Both the Sharp JX 450 and the Howtek Scanmaster give you a clean, crisp scan that is acceptable for comps, video, and animation work. If you are considering doing separations, run some tests of your own before you buy a scanner. The scanning times for these units are relatively fast since they accomplish the scan in one pass instead of the three that the Microtek 300Z requires. Although the MacScan-It software that comes with the Scanmaster is for image-capture only and is a bit obtuse, it does the job. MacScan-It allows for contrast-, sharpness-, and gamma-correction during scanning. Chromascan, the software that comes with the Sharp units, is best left unopened. Instead of giving you a complete view of the scanning setup, the poorly designed interface leads you through a series of dialog boxes, forcing you to remember what you set in the previous boxes. Sharp and Howtek both sell 11-by-17-inch, higher-resolution models (450 and 400 dpi respectively, see "Scanning the Horizon"). Both companies also offer 8½-by-11-inch, 300-dpi scanners, but neither of these can compete with the Microtek MSF-300Z, which sports an 8½-by-14-inch scanning bed.

MSF-300Z The MSF-300Z from Microtek is one of the few good deals that you can get for entry into color today. It's a 24-bit, 300-dpi scanner. After you get past the rather odd SCSI setup, the scanner is convenient to use. The desk accessory scanning software gives you all the basic information, and then some, about a scan. Aside from the DAs (one for color and one for black and white), Microtek includes SuperPaint, Digital Darkroom, and PhotoMac with the bundle. A combination that allows for color, grayscale, and black-and-white retouching. The documentation is sufficient (what do you want for a $2000 street price?).

The MSF-300Z will not set you up for separations, but it can handle just about everything else. If you want to get into color for comps, video, or animation and you don't have a huge budget, the Microtek is an excellent investment that lets you experiment and gives you flexibility without breaking the bank. (As this went to press, La Cie announced another inexpensive color scanner—see "Scanning the Horizon.")

Sharp JX-100M If portability is a requirement and you can get by with 4-by-6-inch scans, take a look at the JX-100M. It comes complete with software and cabling. The scanner has a resolution of 200 dpi and gives surprisingly good results. The only problem we found with it is its incredibly slow scan time—an unbelievable 20 minutes, 35 seconds for a 4-by-6-inch image at 200 dpi. While the JX-100M looks like a hand-held scanner at first, it functions like a flatbed. The soft-

ware that comes with the scanner, Chromascan 100, is a variation that is actually much better implemented than its big brother version.

A Moving Target

The color-scanner market has been hot in the past year, and it shows no sign of cooling off. As this article went to press, developers released or announced a half dozen new machines that we were unable to test fully. Many machines give the scanner shopper a wide list to choose from, with options at every turn.

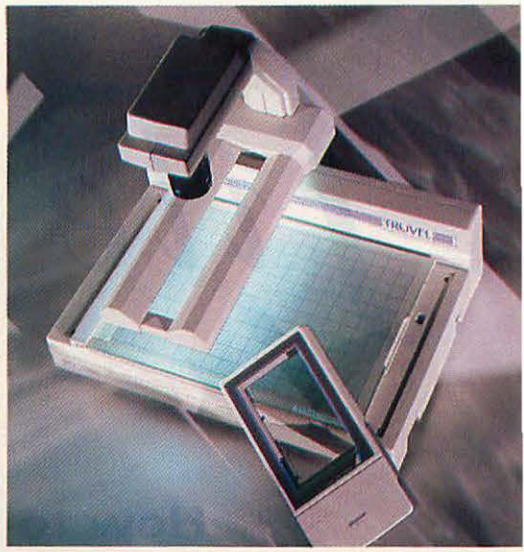
As far as color separations go, although the past year has brought enormous improvements in the quality of scanning hardware and software, scanning is still an emerging technology. If you know the limitations of desktop systems and are willing to work within them, you can get some very good results. The control you can achieve over your product and deadlines is very attractive, but you—or your production department—are taking on a big responsibility. At this point, the amount of money saved by doing your own separation work is negligible compared to the time and money you'll have to invest in learning, and then doing, a job now performed by skilled professionals.

If your interests lie with producing comps or using scans in video, animation, or slides, the story is very different. All of the scanners we looked at provide more than enough quality for any of these purposes. The advantages to doing comp work on the Macintosh are significant. The time you can save on costly remakes and the speed at which you can see an assembled page or package—complete with photography—can be well worth the investment. The new areas of desktop animation and multimedia offer an edge to those who have traditional video and animation skills and are looking for a new way to communicate. So the answer to the question of whether or not color scanning has arrived must really be based upon what you want to do and what your expectations are.

The Nikon LS-3500 is our choice in the slide-scanner category because of its higher resolution and ease of use. In our tests, the Nikon images consistently show more highlight and shadow detail, with better sharpness and color definition. Nikon's Colorflex software is as good a capture application as you'll find.

Our second choice is the CIS 3510 (or, if it's an improvement, the 3515). If you can put up with the annoying focusing procedure and you want to save a couple of grand on hardware, the CIS can provide good results.

On the flatbed side, there is really not much of a choice. If you need an 11-by-17-inch scanner bed, the Howtek Scanmaster is a nice, complete package. If you can get by with an 8½-by-14-inch bed, the Microtek MSF-300Z is a clear winner, again, because it comes complete and the software is easy to use. (Ease-of-use in this area is hard to overvalue; if people don't like using a piece of equipment, they'll leave it to gather dust in a corner.)



Two hybrid designs: The Truvel TZ-3BWC's lens and lighting units traverse the copy stand to scan flat art or 3-D objects. The Sharp J-100M looks like a hand-held unit but works like a mini-flatbed. Place the window over the art to be scanned, and the internal CCD does the rest.

Color-scanning technology is a moving target. At this point, we see this market as the version 1.0 of scanning, with new products and logical improvements on the way. If you've been wanting to take advantage of scanner technology, now's probably a good time to take the first step. There are enough options for almost every budget. Remember, try to define your needs, then go out and fill them. For the majority of purposes, continuous-tone color has arrived. ■

See *Where to Buy* for contact information.

SCANNER RESOLUTION

	Maximum Resolution (in dpi)	Enlarged to 3 x 5	Enlarged to 5 x 7	Enlarged to 8 x 10	Enlarged to 11 x 14
CIS 3510	1024	310	205	128	93
CIS 4520 slide	2000	606	400	250	182
CIS 4520 4x5	500	500	357	250	179
Eikonix 1435	3000	909	600	375	273
Howtek Scanmaster/35 (rectangular pixels)	2000 x 1333	606 x 404	400 x 267	250 x 167	182 x 121
Howtek Scanmaster/35 II	2000	606	400	250	182
Nikon LS-3500	4096	1240	820	512	372
Spectre5000 4x5	1250	1250	893	625	446

When you're working with slide scanners, resolution can be a tricky issue. This table should help if you're trying to dscide whether a scanner has enough resolution for your purposes. In general, you'll achieve best results at a ratio ranging from 2:1 to 1.4 : 1 between your input resolution at the desired print size and lines per inch of your halftone. (Since proportions between slides and standard enlargement sizes are not exact, all figures are approximate.)

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file Services

How to move and share files over an appletalk network



In only 18 months, choosing a Macintosh file server has gone from a fairly cut-and-dried process to one fraught with complexities. Before, you just decided between a centralized file server, like AppleShare, and a distributed file server, like TOPS. Now a dozen different file servers support Apple's AppleTalk Filing Protocol (AFP). At least a dozen other non-AFP schemes allow Macs to share and transfer files over a network. The options alone are enough to drive anyone share-crazy.

To make things more complicated, not all file-service schemes are aimed at the same types of users and network setups. Products offer capabilities ranging from simple to sophisticated. Some permit users to simply transfer files over a network. Others, high-end server products, are designed with more security and multiuser access to databases in mind.

In this article, I look not only at high-end and low-end products, but also at products in-between. At the same time, I offer advice on when you might pick one approach to file service over another.

Quick-and-Dirty File Transfers

If all you want to do is transfer files between users on a network, you don't need the power of a full-blown file server. Instead, take a look at network file-transfer utilities like Claris Corporation's Public Folder, Flash from Beagle Bros, Personal Software Development Corporation's Personal Phone, Gizmo Technologies' Send Express, or Traveling Software's LapLink Mac III Network Pac.

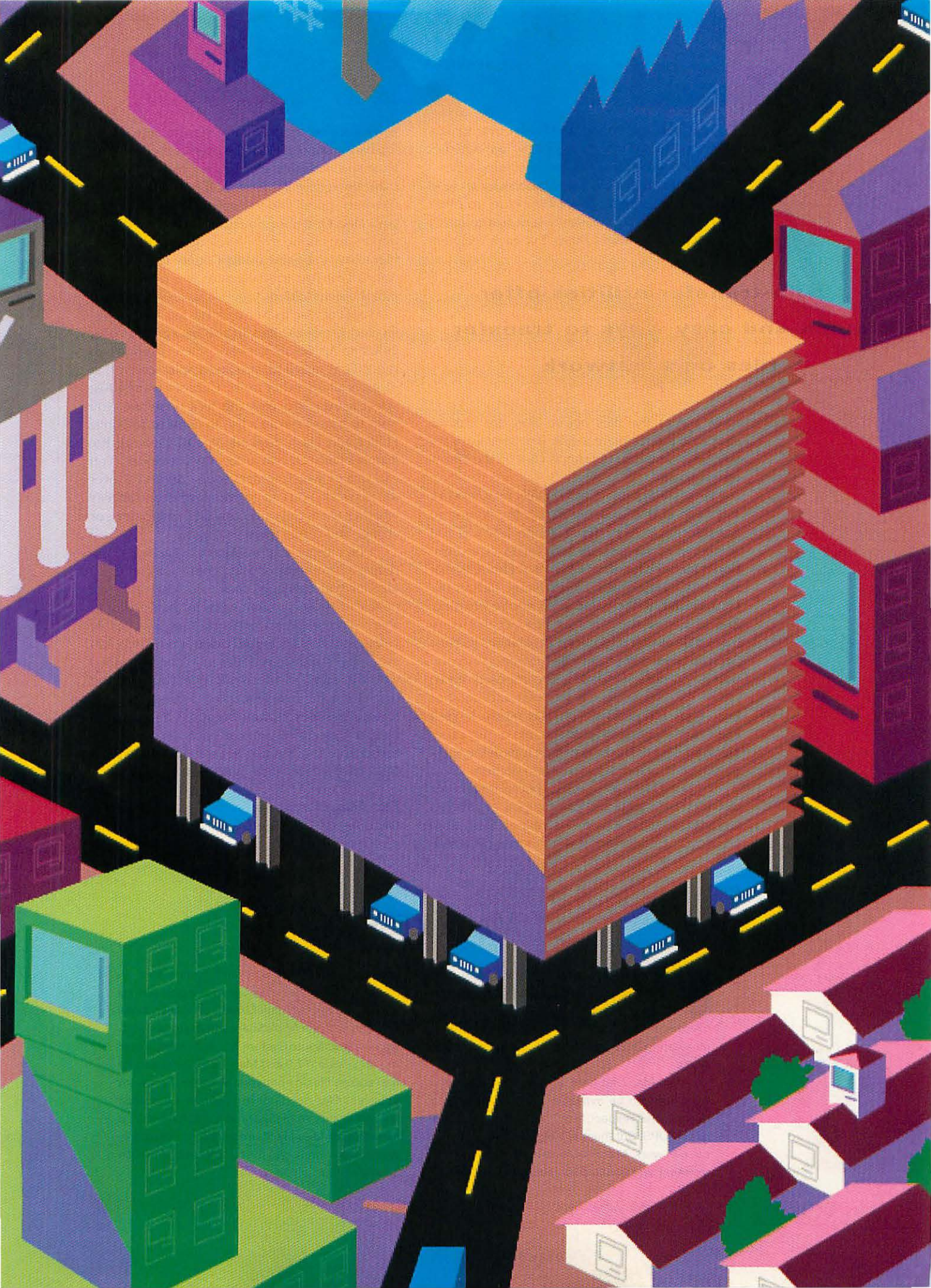
These products aren't file servers: they offer only the most basic security measures for files or disks and aren't designed for multiuser file access. But they can definitely get a file from here to there over a network (see "File Transfers").

Public Folder is a utility available free to any licensed user of Claris software. To install it, put the Public Folder resource in your System Folder, create a special folder called Public (hence the program's name), then put any files you want to transfer in that folder. When other Public Folder users select Public Folder in the Chooser and connect to your Public folder, they see the contents of your Public folder and can copy those files to their Mac over the network. For security, users see only what you put into the Public folder and cannot access anything else on your disk. But you cannot restrict access to any Public folders, nor can you designate some files for certain users and prevent other users from looking at those files.

Public Folder only lets users retrieve files—it won't automatically send files. Send

SCOTT BALDWIN

by Dave Kosiur



Express, Personal Phone, and Flash can automatically send files. They differ in how and whether they notify a recipient that files are being sent.

Send Express uses a desk accessory to send files, or the contents of the Clipboard, to other users. Files are automatically sent to the users' Macs when you select them, but each recipient

File-transfer utilities offer quick and easy ways to transfer files on a network

must accept the files before they are actually stored on the recipient's disk. If you receive a file you don't want, you can simply click on the Throw Away button.

Personal Phone actually fulfills two network functions in one desk accessory. In addition to transferring files, Personal Phone lets you call someone on the network and type in a conversation. One nice feature of Personal Phone is that you and another user can exchange files in the background at the same time you're chatting. And as I write this, another product that combines file-transfer and phone capabilities has just been announced by Caravelle Networks Corporation. Caravelle's Mac-to-Mac is composed of two parts: TextPhone, which lets you and another user type interactively on the network; and FileShare, which lets you access files on any other Mac running FileShare. FileShare runs in the background and includes password protection.

To use Flash, you create special folders for intended recipients and place copies of any files you want to send into those folders. Flash then takes over, sending the files—to the people whose names are on the folders—over the network, in the background. If Flash discovers that other users have specified that files be sent to you, it automatically receives them too. It puts any received files into special folders named for the sender on your Mac. One note: Since all of the Flash special folders are buried a few levels deep in the folder hierarchy, I suggest using a utility like CE Software's DiskTop to make sure you transfer files into the right folders.

LapLink Mac III Network Pac lets Macs transfer and exchange files in the background over either an AppleTalk network or a modem. When the INIT is installed, you see a split screen that displays all the other users' Chooser names. Just select a user and pick the files or folders you want to transfer from a list. In contrast to Public Folder and Flash, LapLink Mac III Network Pac features fairly extensive security provisions. You can specify which folders users can access over the network; you can go even further and specify whether users can only copy files and folders, or change and delete them.

Don't forget that products like Farallon Computing's Timbuktu or Microcom's Carbon Copy Mac let you exchange files too. While the real power of those programs lies in their ability to share screens over a network, they also enable you to transfer files in the background; Timbuktu even places transferred files in folders identified with the name of the sender. Or you may find that electronic mail (E-mail) is a better solution for moving files around because you can send files to a group of users at once. (For more information on E-mail, see "E-Mail: A Postal Inspection," *Macworld*, June 1990.)

Files, Files, Everywhere

Distributed file servers let a Mac operate as a file server and as a client of another file server simul-

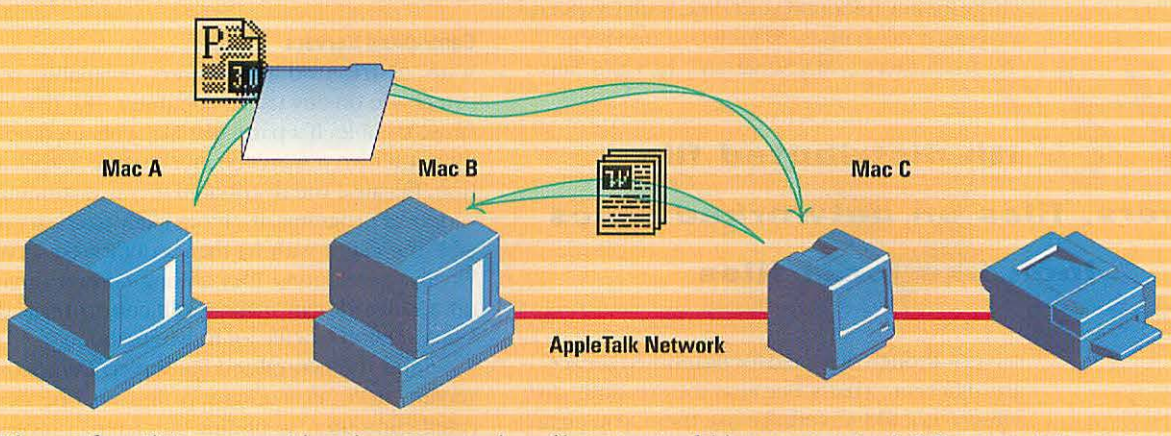
MAC FILESHARE

First, there was AppleShare, a dedicated, centralized file server from Apple. When System 7.0 is introduced, there'll be Macintosh FileShare (Mac FileShare for short), distributed file-sharing software from—you guessed it—Apple.

With Mac FileShare, files on all, or part, of a hard disk can be available to other networked users. In that respect, Mac FileShare is very similar to TOPS. But there is a big difference in how the two work. Mac FileShare is AFP-compatible, meaning you can access files with AppleShare client software; TOPS is not AFP-compatible.

Mac FileShare works because Apple has incorporated parts of AppleShare—previously available only with the AppleShare administration software—directly into System 7.0. As a result, a Mac running System 7.0 and Mac FileShare makes its files accessible on a network. Macs that only want to access files need not run System 7.0 or Mac FileShare, just AppleShare client software. You can think of Mac FileShare as being essentially AppleShare running in the background without a central server.

FILE-TRANSFER UTILITIES



File-transfer utilities are a quick and easy way to share files or entire folders over an AppleTalk network; however, they do not permit multiuser access to a file. The difference between file-transfer utilities and true server setups is that the shared files are physically moved to the recipient's Mac. With file servers, files don't have to be on local Macs for users to access them. Here, Mac A is sending a PageMaker document and folder to Mac C; Mac C, meanwhile, is sending a Word document to Mac B.

taneously (see "Distributed Service"). Each user decides which disks or folders to make available, or *publish,* on the network. Other client users can then *mount* those published disks or folders and use them as local disks or files. Distributed servers let you not only transfer files but also set up files for multiuser access.

TOPS has long been the leader in distributed server technology for Macs and even IBM PCs; it's now sold together with TOPS' InBox E-mail system as the Network Bundle. But TOPS is now being challenged by Personal Server Network (PSN) from Information Presentation Technologies (IPT). In addition, Apple has announced its own version of distributed server software called Macintosh FileShare, which will be part of System 7.0 (see "Mac FileShare").

TOPS version 3.0, the latest version, fixes two major user complaints. First, it no longer corrupts large files on Ethernet networks. Second, TOPS now supports the file-locking and byte range–locking mechanisms—called *shared environment extensions*—implemented by Apple in AppleShare server software. As a result, multiuser databases such FoxBase+/Mac, Omnis, 4th Dimension, and FileMaker II now run over TOPS.

However, TOPS 3.0 still doesn't fully implement AFP; TOPS files and volumes, unlike AppleShare volumes, are not accessible from the Chooser. You must use the TOPS DA to mount TOPS volumes.

On the other hand, PSN fully supports both Apple's shared environment extensions and AFP. Thus a Mac running PSN can act as a file server to other networked users in the background. Those other users can use the AppleShare client software to access files.

PSN also lets you grant access privileges to folders and files just as AppleShare does; for example, you can create access rights for groups of users. You can even use PSN's loopback mode, which makes you log on to your own Mac to use any disks or folders. (While loopback may sound strange, it's a logical extension of server privileges. Others can use your Mac as a server and not worry about you accessing their files.) TOPS, meanwhile, doesn't offer any group-assignment options. All of its access control is done on an individual basis, with a password.

Share and Share Alike

Two other new products, Everyware's allShare and ShirtPocket Software's EasyShare, are designed with distributed file services in mind. Like PSN they allow a Mac to function as a background AFP file server. Unlike PSN (or TOPS for that matter), allShare and EasyShare let you set different priorities for server functions and foreground applications on the Mac. In other words, you control the amount of Mac processing power that gets used for file-server functions. That ensures any application you're running won't slow to an unusable crawl when someone else is using a database file on your Mac.

allShare installs as a Control Panel device. It provides standard AppleShare security for an en-

tire disk, for up to ten folders, or for all but one folder on the disk. EasyShare is a desk accessory. Like allShare, EasyShare offers the standard AppleShare security but also includes password security for any folder on your disk. With EasyShare you can publish up to 20 folders at one time.

With distributed file servers, files on networked Macs look like local files

InfoSphere's MacServe and La Cie's Silverserver—though designed for distributed service—are different. That's because they're both *disk servers,* not file servers. To use them, you create a partition on a hard disk. MacServe can partition itself; you'll need La Cie's Silverplatter to partition a disk for Silverserver. That partition on the hard disk appears to networked users as a disk on which they can store and share files.

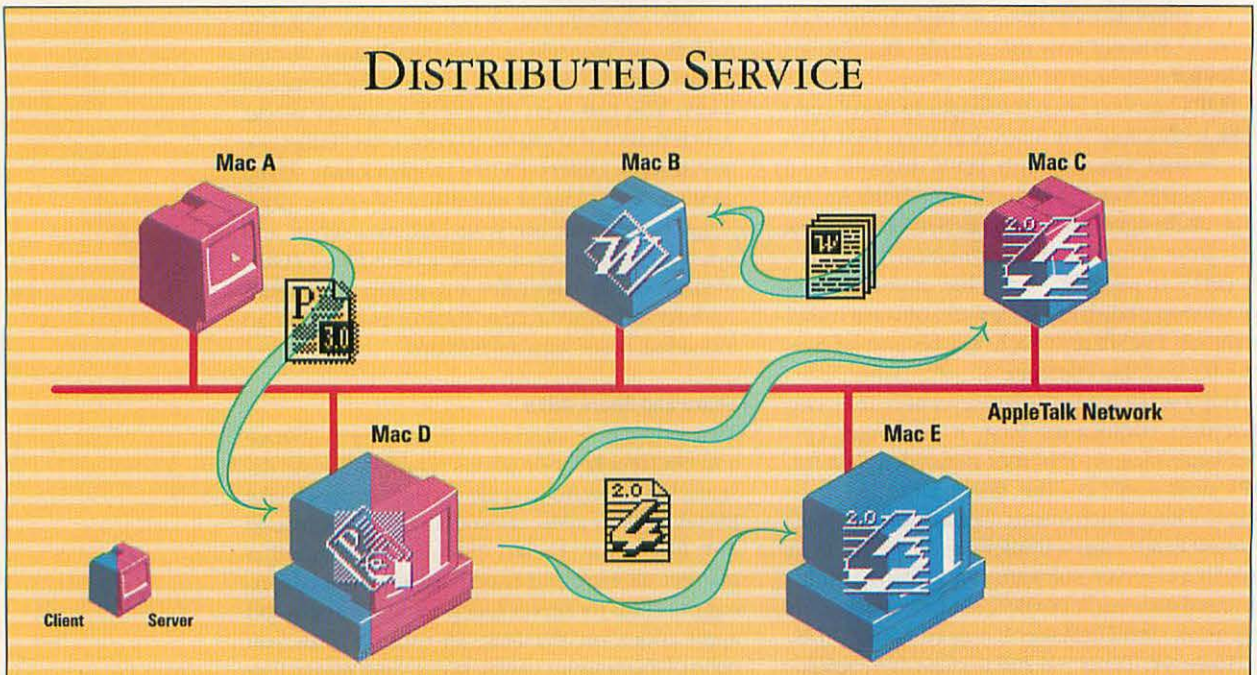
If a MacServe volume is read-only, multiple users can look at a file on that volume simultaneously. If a volume is set up for reading and writing, only one user at a time can access a file on it, making MacServe unsuitable for multiuser databases. Silverserver's partitions can be either shared or private, and they can be accessed via modem too. More than one user can use shared Silverserver partitions at the same time.

Centralized Servers

With distributed file servers, available files can reside on any user's computer. But that can cause trouble. If a particular Mac gets used heavily as a server, it won't be much use as a workstation. Because the distributed server is running a variety of programs, it's more likely to crash (and take the client with it) than a dedicated server. Finally, distributing files among several servers on a network can make it difficult to track the latest version of a file, or its whereabouts.

Enter the centralized file server. Centralized servers store all workgroup files on one dedicated computer, so finding files isn't a problem. Rather than each individual user worrying about file and folder security, one server administrator takes care of assigning access privileges (see "Centralized Service").

As far as dedicated, centralized file servers go, AppleShare has always been the premier product for Mac networks. AppleShare software lets you turn a Mac with up to seven attached SCSI hard disks into a file server. Client Macs sitting on LocalTalk, EtherTalk, or TokenTalk can all



Running distributed server software, a Mac can simultaneously function as a client and a server. Here, Mac D (running PageMaker) is a client of Mac A. Mac D is also acting as a server to both Mac E and Mac C (both running 4th Dimension, a multiuser application). If the distributed server supports multiuser access, Mac E and Mac C can actually be accessing the same 4D file on Mac D. Mac C is also a server for Mac B (running Microsoft Word).

SERVING YOU

	Vendor	Prices[1]	AFP-compatible	Supports Shared Environment Extensions	Required Server Hardware	PC Support	Other Functions
File-Transfer Utilities							
Flash	Beagle Bros	$200	No	No	Mac	No	
LapLink Mac III	Traveling Software	$299.95	No	No	Mac	Yes	
Network Pac							
Mac-to-Mac	Horizon Software	TBA	No	No	Mac	No	interactive conferencing
Personal Phone	Personal Software	$99	No	No	Mac	No	interactive conferencing
	Development Corporation						
Public Folder	Claris Corporation	free	No	No	Mac	No	
Send Express	Gizmo Technologies	$179	No	No	Mac	No	
Distributed Servers							
allShare	Everyware	$200	Yes	Yes	Mac	Yes[2]	
EasyShare	ShirtPocket Software	$150	Yes	Yes	Mac	Yes[2]	
MacServe	Infosphere	$250	No	No	Mac	No	disk server
PacerTOPS	Pacer Software	$400+	No	Yes	VAX	Yes	
Personal Server Network	Information Presentation	$150	Yes	Yes	Mac or PC	Yes	
	Technologies						
Silverserver	La Cie	$100	No	No	Mac	No	disk server
Network Bundle for Mac	TOPS	$300	No	Yes	Mac or PC	Yes	print spooling, E-mail
TOPS for A/UX	Starnine	$900+	No	No	Mac	Yes	
TOPS for Sun	TOPS	$1000+	No	No	Sun	Yes	
Xinet	Mt Xinu	$900+	No	No	UNIX	Yes	
Centralized Servers							
3+/3+Open	3Com	$2500+	Yes	Yes	PC	Yes	print spooling
AlisaShare	Alisa Systems	$4700+	Yes	Yes	VAX	Yes[2]	print spooling, file translation
AppleShare	Apple Computer	$800	Yes	Yes	Mac	Yes[2]	print spooling[3]
DaynaNET	Dayna Communications	$800+	Yes	Yes	PC	Yes[2]	print spooling
DirectServe	Jasmine	$1795	Yes	Yes	proprietary	Yes[2]	
GatorShare	Cayman Systems	$2000	Yes	Yes	UNIX/NFS	Yes[2]	
K-Share	Mt Xinu	$500+	Yes	Yes	UNIX	Yes[2]	
MacLAN Connect	Miramar	$1000	Yes	Yes	PC	Yes	
Netware	Novell	$1600+	Yes	Yes	PC	Yes	print spooling
PacerShare	Pacer Software	$2400+	Yes	Yes	VAX	Yes[2]	
uShare	Information Presentation	$3000+	Yes	Yes	UNIX	Yes[2]	print spooling
	Technologies						

[1] Depending on vendor, prices will vary based on the number of network users. Many vendors offer site licenses. [2] using PC AppleShare [3] using AppleShare Print Server

access the server via the Chooser. Apple's release of PC AppleShare version 2.0 updates the IBM PC version of AppleShare so that PCs sitting on LocalTalk, Ethernet, or token-ring networks can access an AppleShare server; before, only PCs on LocalTalk could.

The big disadvantage to centralized servers like AppleShare is that they require dedicated computers. And despite the fact that an AppleShare server can also act as a print server and E-mail server, dedicating a Mac to server functions can still be prohibitively expensive. A more cost-effective solution may be to convert an IBM PC AT or compatible into an AppleShare server for the network.

Dayna Communications' DaynaNet, which uses a dedicated PC as a server, is an example of an AFP-compatible server. Because of its Netware heritage (Dayna helped Novell develop Netware for the Mac), however, DaynaNet offers more complex security options than does AppleShare. While you can use standard AppleShare client software to access DaynaNet files, you must use the Netware DA or Netware Control Center—which you install for DaynaNet—to change the access rights to documents or folders.

MacLAN Connect from Miramar offers features similar to DaynaNet. It provides full AFP compatibility to Mac users and can also function as a gateway to other PC-based servers such as Netware. One added advantage to MacLAN Connect is that, unlike DaynaNet, MacLAN Connect

operates in the background on the PC. As a result, you can use the MacLAN Connect server for other purposes, albeit to a limited extent.

Another alternative is Jasmine's DirectServe, a stand-alone box—not a PC—that has most of the Appleshare 2.01 functionality in read-only memory (ROM). Although the DirectServe can perform a bit faster than a Mac-based AppleShare server, you can't install any print-server or E-mail–server software on it. Nor can you take advantage of the DirectServe's speed by putting it on an Ethernet network—there's only a LocalTalk port. (Jasmine president William Bayer acknowledges that some customers have encountered problems with the DirectServe, but says that the company—which filed Chapter 11 in March—will offer an upgrade to address those problems. Nevertheless, *Macworld* recommends that potential purchasers of the DirectServe wait until the upgrade is available before buying.)

On a network with heavy traffic, the faster and more powerful the server is, the better

More Power If You Need It

Can a workgroup outgrow a server? The answer is yes—especially when many users are all accessing large multiuser databases. In such cases, the faster the server the better. But even using a Mac IIci or IIfx as a server won't give you simultaneous support for multiple networks or unattended tape backup. Those are features you'll find only in high-end servers. Unfortunately, because they're PC-based, many high-end servers, such as 3Com's 3+ and 3+Open and Novell's Netware, still treat the Macintosh user as a second-class citizen.

3Com does automatically provide Mac support with 3+ servers. However, it wasn't until recently that 3+ became fully AFP-compatible. Macintosh users can now access 3+ servers using the standard AppleShare client software. 3Com's next generation of file servers is called 3+Open. It's more powerful than 3+, offering features like server multitasking and a form of interprocess communication. But since the current Mac version doesn't support those advanced features, a Mac can only use the file and print services of 3+Open.

In Netware, Macs on LocalTalk or Ethernet also see a Netware server as an AFP-compatible server. Admittedly, Novell's original Mac software was slow, and there were bugs, especially with Netware's print spooling. Those bugs have been corrected with the current version of Netware software. Other Netware features include fault tolerance (automatic duplication of disks, directories, and/or files on other media), support for uninterruptible power supplies, and gateways to other network systems. But again, not all of Netware's features, for example gateways and remote server access, are currently available to a Mac user. Those features won't be available until Novell releases an AFP-compatible Network Loadable Module (NLM) for Netware 386; that NLM should be out this summer.

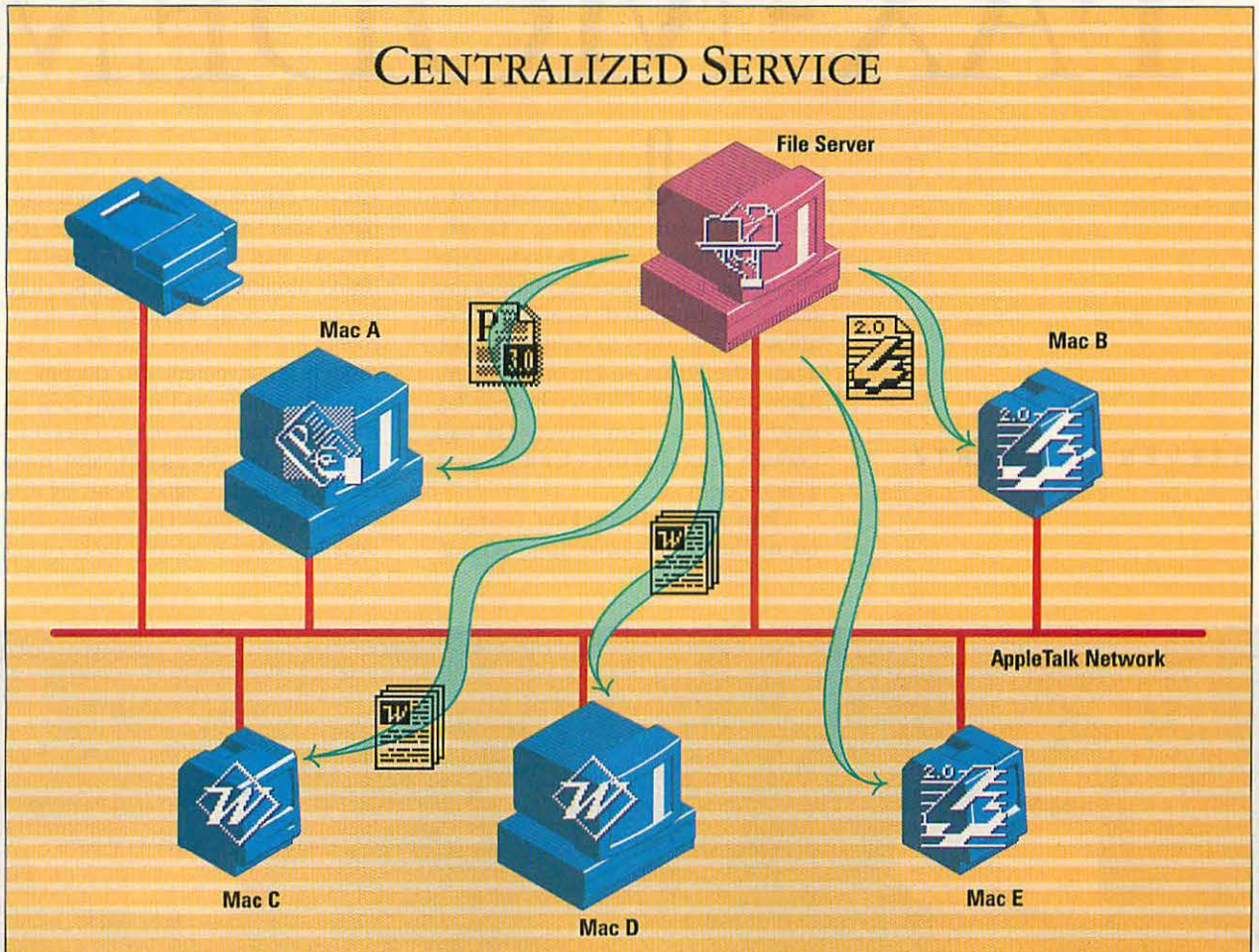
One solution to the high-end server dilemma is to use not a PC or a Mac, but a Digital Equipment Corporation VAX or UNIX computer as a file server for Mac networks. Both Alisa Systems' AlisaShare and Pacer Software's PacerShare allow a VAX to act as an AFP-compatible server. And they provide print services as well as easy-to-use file-exchange facilities for trading files with VAX and PC users. Pacer also offers PacerTOPS, an implementation of TOPS for the VAX. (For more information, see "Mac to VAX and Back," *Macworld,* May 1990.)

Two software products, IPT's uShare and Mt Xinu's K-Share, turn a UNIX computer into an AFP file server for Macs. Another Mt Xinu product, Xinet, provides TOPS support on a UNIX computer. GatorShare from Cayman Systems, meanwhile, translates Mac-issued AppleShare requests into Network File System (NFS) requests understood by most UNIX computers. Rather than running on the UNIX computer itself (like uShare or K-Share), GatorShare runs on Cayman's LocalTalk-Ethernet gateway called GatorBox. With GatorShare, you can access any NFS file servers with AppleShare client software on the Mac; NFS users, in return, can access AppleShare volumes as if they were NFS volumes.

Sorting It Out

As you can see, there are a variety of ways to move files around on a network. I've found that file-transfer utilities can accommodate any size Mac network. While Public Folder is easy to use, my favorite file-transfer programs are LapLink Mac III Network Pac and Send Express. LapLink Mac III Network Pac has good security options and modem support, but doesn't support zones. On the other hand, Send Express handles zones and lets you transfer the Clipboard as well as files; it's fairly secure since recipients must acknowledge any files that you send. If your network includes both Macs and PCs, TOPS' Network Bundle (which includes TOPS, InBox, file translators, and print spoolers) offers one-stop shopping for a slew of network services.

For medium-to-large networks, AppleShare (if you can afford a dedicated Mac) and DaynaNet (if you can't) are good choices. Many networks



In a centralized-server system, one computer (labeled File Server) is dedicated to holding shared files and information for all users on the network. Macs other than the server can act only as clients. Here, three different types of files are stored on the centralized server. Mac A (running PageMaker) is working with a PageMaker file on the server as if it were on a local disk. Mac B and Mac E (both running 4th Dimension) are simultaneously accessing the same 4D database file from the server. That's possible because both 4D and the server support multiuser access. Mac C and Mac D (both running Microsoft Word—an application that doesn't support multiuser access) are working with two different Word files on the server.

that start out using distributed servers like TOPS switch to centralized servers when they grow, for performance reasons. For very large networks, centralized PC-based servers are probably the best solution. Netware and 3+Open have decided performance advantages over their Mac counterpart AppleShare.

If you're trying to decide which file service is best for your network, use the following questions first, to establish the type of product you need.

- How large is your workgroup?
- Are Macs the only computers on your network, or are there PCs, VAXs, or UNIX computers too?
- Are you interested only in transferring files? Translating files? Sharing files?
- How do you want to control security—who can see, delete, or copy a file?
- What computer can you use, or do you want, as a server?

Once you've answered those questions, take a look at the table "Serving You" to guide you through the selection process. Even though there are so many Mac file-service schemes to pick from, don't think of it as a choice fraught with complexities. Thanks to the growing number of options, it's a choice full of possibilities. M

See *Where to Buy* for contact information.

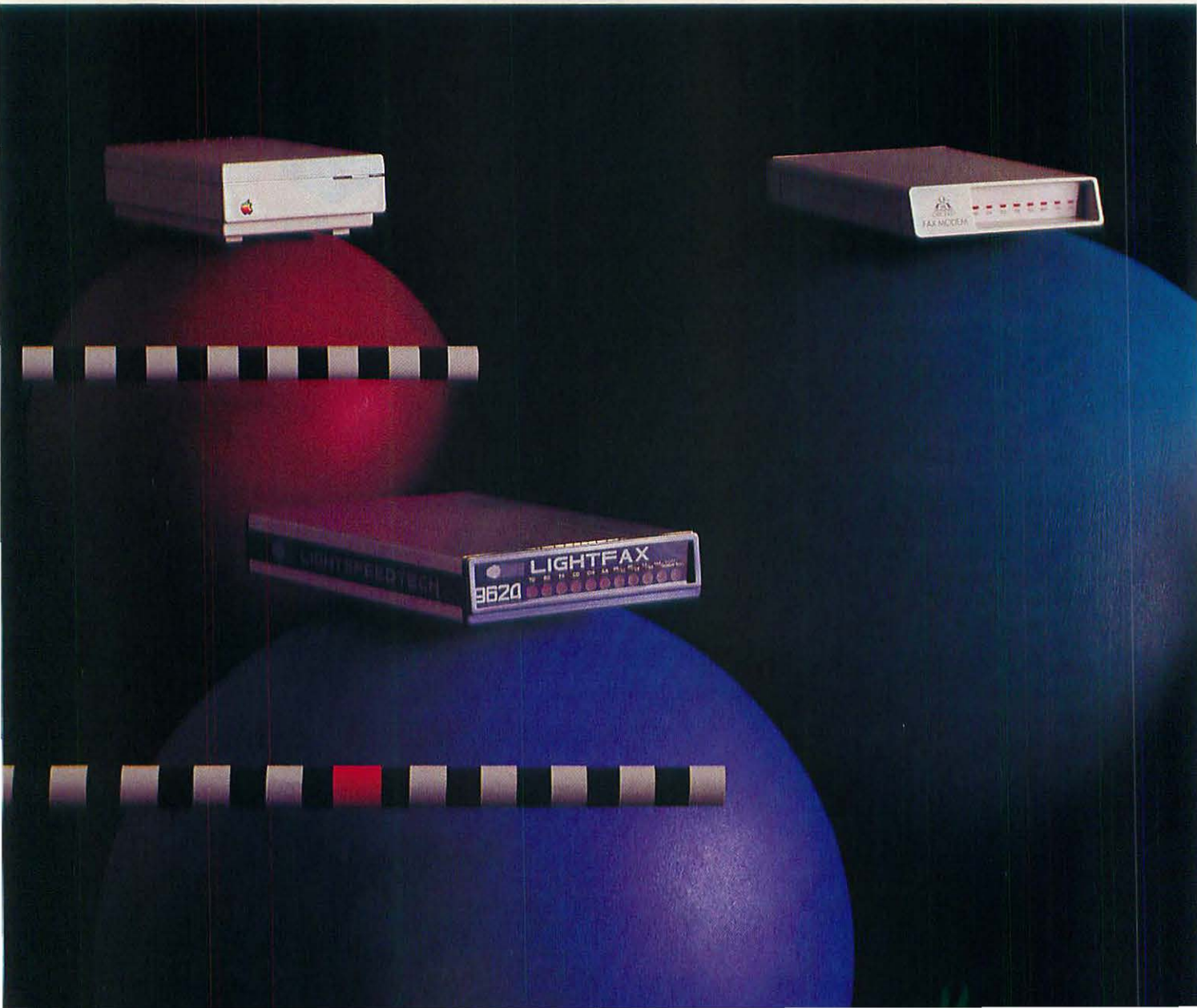
***Dave Kosiur**, a* Macworld *contributing editor, is the publisher of* Connections, *an international newsletter concerned with Macintosh networking. He's been running so many file servers, he can't remember where his original files are.*

FAX-MODEM

BY STEVEN SCHWARTZ

Over the past two years, the luxury of owning a facsimile, or fax, machine has become a necessity for doing business. Many of the faxless are frustrated because they're always being asked to send or receive a fax. I should know: I'm one of them. After answering "I don't have a fax machine" too many times, I'd had enough. I decided to look into buying a fax modem.

Why a fax modem? First, buying a fax modem is a couple hundred dollars less expensive than buying a standard, stand-alone fax machine. (Of course, that wouldn't be true if I didn't already own a Mac.) Second, because I create most of the documents I need to fax on my Mac, a fax modem is convenient. The document goes straight from the hard disk to the fax modem; there's no need to print out the document, and then feed it through a stand-alone fax machine. Finally, most fax modems also double as data modems. By hooking



INFLUX

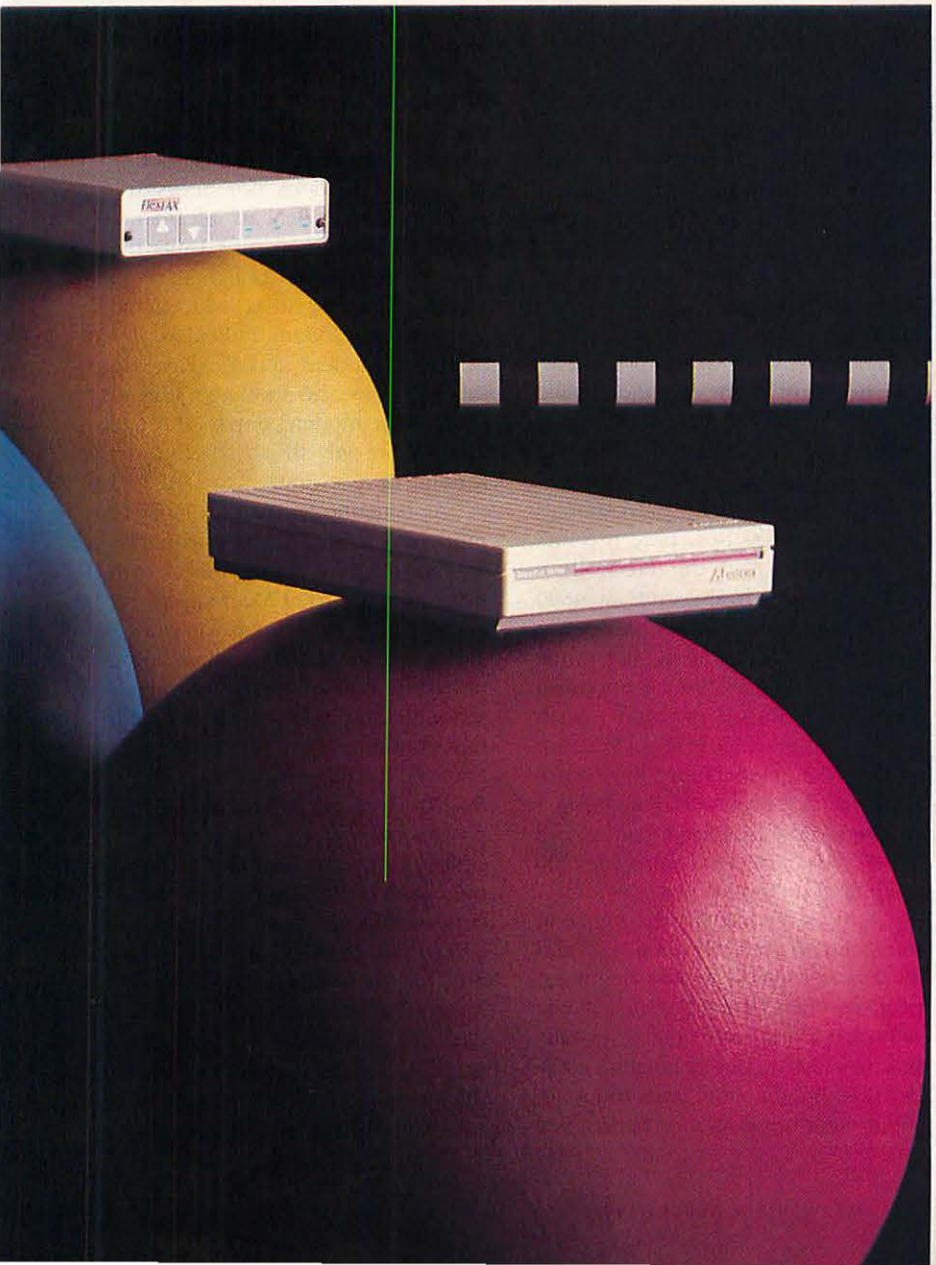
Fax modems offer convenience, but still not without pitfalls

up one device—the fax modem—to my Mac, I can have a handy, multipurpose data communications center.

Sounds nice and straightforward, doesn't it? Of course, things are never quite as easy as they sound.

The first thing I found out was that the Mac fax-modem market is still in a state of flux. Even though over 20 fax modems—internal and external—have been announced, only a handful were shipping when I wrote this article. More fax modems are being announced every month (see "Networking Fax Modems"). Several products either have undergone or are undergoing significant changes.

The second thing I discovered is that the currently available fax modems present a wide variety of choices. I had to evaluate internal versus external fax modems, transmission speed, and output quality. I also found that important capabilities of a fax modem are often dictated by its software (see "What Makes a Fax Modem?"). Before you buy, give some thought to how the options I encountered square up with your needs.



MARK JOHANN

Pictured here are (clockwise from upper-left corner) Apple's AppleFax Modem, the OrchidFax from Orchid Technology, the FlexFax 9624 from Circuit Research, Abaton's InterFax 24/96, and the LightFax 9624 from Computer Friends.

Fax Modems in Action

All fax modems come with a software fax driver, a Chooser resource, that goes in the System Folder. A second piece of software is the fax-modem application, which lets you—among other things—view received faxes, maintain a phone directory and fax log, and set preferences.

To send a fax, all you have to do is select the fax driver in the Chooser (making it the current output device), and print the document to the fax modem. This allows you to send faxes from inside any application. Software then converts the document to fax format for sending. You can opt to send the document over the phone line immediately, or to store it on disk for transmission at a later time.

Receiving a fax is just as easy. As long as both the Mac and the fax modem are on, and the fax modem software is set to answer the phone, incoming faxes are automatically saved on your hard disk.

The Ins and Outs

Just like data modems, fax modems can connect to a Mac in two ways: externally, via the Mac's serial port, or internally, as an add-in board in the Mac II, SE, or Portable. At the time I wrote this virtually all currently shipping fax modems were external models. The only exception was La Cie's 2400 Data and Fax Portable Modem, an add-in board for the Macintosh Portable. By the time you read this, several more internal fax modems should be available.

The advantages and disadvantages of external and internal fax modems

NETWORKING FAX MODEMS

A typical fax modem can't be shared by several users; it's attached to one Mac. However, stand-alone fax machines are usually shared by many users. And so, fax-modem vendors, taking notice of group-use fax machines, made networkable fax modems the rage.

Solutions, the developers of BackFax, takes the software approach to sending and receiving faxes over an AppleTalk network. The company's Faxgate is a facsimile gateway that works with Mac electronic-mail systems like CE Software's QuickMail and Microsoft's Microsoft Mail. Solutions also offers FaxShare, which allows Mac networks without E-mail to share a single fax modem.

Cypress Research takes the hardware approach to network fax modems with FaxPro, a 9600-bps fax modem with 2400-bps data capabilities. FaxPro attaches directly to the LocalTalk network, becoming a network resource to all users on the net. FaxPro is available in two versions. The first allows the unit to operate in conjunction with installed TOPS or AppleShare file servers; the second offers a nondedicated AppleTalk Filing Protocol–compatible file server, FaxPro Share, for networks not running TOPS or AppleShare.

Dove Computer Corporation's DoveFax Desktop is another 9600-bps fax modem with 2400-bps data-modem capability. At the April Macworld Expo, Dove also announced an internal fax modem for the Mac II, the DoveFax NuBus. Both will be available in network versions (the DoveFax Networkable Desktop and DoveFax Networkable NuBus).

Finally, Global Village Communication introduced the TelePort/Plus 2, a 4800-bps fax modem with a twist. Rather than connecting to the Mac serial port, it uses the Apple Desktop Bus (ADB). The TelePort/Plus 2 also includes data-modem capabilities of up to 2400 bps, with MNP Class 5 data compression and error correction.
—Brita Meng

mirror those of data modems. Externals work with any model Mac from the Plus up. (Some can even work with earlier Macs, depending on the version of Mac system software you run.) However, external fax modems take up desk space and require a separate power supply. Internal fax modems draw power from the Mac itself; they don't take up extra space and are easy to transport. But they can be difficult to install. More important, internal fax modems have no indicator lights to show you what's going on or help you figure out what's going wrong when you're faxing.

Because they're the most readily available, I tested seven external fax modems for speed and output quality: Abaton's InterFax 24/96, Apple's AppleFax Modem, the FlexFax 9624 from Circuit Research, Computer Friends' LightFax 9624, Orchid Technology's OrchidFax, the ProModem 2400MFax from Prometheus Products, and the FAXstf from STF Technologies. I faxed three different documents to an ordinary Group 3 fax machine (a Sharp FO-550) in both Standard and Fine modes.

Hardware Options

Although all of the fax modems I worked with were Group 3–compatible, not all of them send and receive at the Group 3 standard 9600-bits-per-second (bps) data rate. For example, the FAXstf only runs at 4800 bps. The AppleFax Modem, even though it sends at 9600 bps, only receives at 4800 bps. And the ProModem 2400MFax, which also runs at 4800 bps, is a send-only fax modem.

Having a fax modem that sends and receives at 4800 bps will not cause any compatibility problems with Group 3 fax machines. That's because all Group 3 fax machines have automatic fallback protocols. If a Group 3 machine can't establish a connection at 9600 bps, it tries to connect at 7200 bps, and then at 4800 bps.

As I discovered, the difference in transmission times between 9600 and 4800 isn't as great as you might expect (see "Benchmark Testing"). If you only plan to fax every once in a while, you may save money by buying a 4800-bps unit. But the more faxes you send, the greater your phone charges will be. So, if you plan to send faxes often, a higher-priced 9600-bps fax modem will probably pay for itself quickly in savings on phone bills.

There were some other hardware differences among the units I examined. Neither the FlexFax nor the FAXstf has a power switch. Although it sounds trivial, not having a separate on/off switch can sometimes be a significant disadvantage. As with printers, the most reliable way to reset a fax modem that's having problems is to simply turn it off and back on.

Two of the fax modems, the AppleFax Modem and FlexFax, include a pass-through port. That means you do not have to sacrifice a Macintosh's serial port to connect a fax modem. A pass-through port allows you to hook up another serial device without resorting to an A/B switch box, or worse, switching a serial cable between the fax modem and another serial device.

I found that a full set of clearly marked indicator lights is a big help when it comes to troubleshooting. (Fax software does not necessarily provide a great deal of information about fax-modem status.) Units that have a complete set of lights are the InterFax 24/96, LightFax 9624, OrchidFax, and ProModem 2400MFax. The AppleFax Modem and FlexFax 9624 merely show the modem's current mode—fax, modem, or pass-through. The FAXstf only shows whether it is sending or receiving.

As I mentioned before, most fax modems can also function as normal 2400-bps data modems. The exceptions here are the FAXstf and AppleFax Modem; the LightFax will work as a data modem if you purchase an optional add-on modem module. I think a double-duty fax modem is nice to have, but only if you can easily switch between the different modes.

The InterFax takes the best approach to switching. It just checks the signals being received and automatically selects the appropriate mode, data or fax—no fuss, no muss. The FAXstf, ProModem 2400MFax, and FlexFax—all of which come with data-modem capabilities—can't function as data modems unless you turn off the send/receive fax options in BackFax, the fax-modem software that all three use. The FlexFax adds another layer

of difficulty by also making you push a front-panel button to change modes. The LightFax 9624 includes a DA called Swap, which lets you flip between modes.

Three fax modems have a specialized data-modem capability. The AppleFax Modem, FlexFax, and OrchidFax can transmit standard Mac data files at 9600 bps, but only if the fax modem on the receiving end is also one of those three. While it's nice to be able to switch to transmitting data, I don't think this feature will get used much unless your company standardizes on a single fax-modem brand for all its branches.

A Matter of Fonts

I found that the trickiest part of using a fax modem is producing acceptable output. That's due to the difference in resolutions between Mac screen fonts—72 dots per inch—and the Group 3 fax standard—203 dpi. If you want high-quality text transmissions, you have two choices.

The first solution is to install triple-size letter-quality fonts in the System file, like those available with the Apple ImageWriter LQ. Then, make sure the faxes you send use only the fonts for which you have the triple sizes (see "Resolving Resolution"). Any text formatted in other fonts will be marginally readable and you will find they often exhibit unusual spacing problems.

It's worth noting that two fax modems—the AppleFax Modem and OrchidFax—provide triple-size Apple LQ fonts for popular sizes of Times, Helvetica, Courier, and Symbol. The InterFax units come with two Bitstream outline fonts, SWA Dutch and SWA Swiss, that look like Times and Helvetica, respectively. To get the best output from an InterFax, you have to reformat the documents you want to fax in those fonts. The FlexFax offers Tribune and Hermes (also Times and Helvetica look-alikes); the ProModem 2400MFax offers Courier and Symbol—in addition to substitutes for Helvetica and Times, Helv and TmsRmn. Again, you have to use those substitutes in a document for high-quality fax output. Neither the LightFax nor the FAXstf comes with any fonts.

FAX MODEMS

	Fax Modem Name	Price	Type[1]	Fax Data Rate[2]	Data Modem Speed[2]	Interface
Abaton	InterFax 12/48	$395	E	4800	1200	25-pin RS-232C
	InterFax 24/96	$595	E	9600	2400	25-pin RS-232C
Apple Computer	AppleFax Modem	$699	E	9600[3]	[4]	8-pin DIN
Applied	DataLink	$299[5]	I	4800[6]	2400[7]	Mac Portable
Engineering	Mac/Portable					board
	DataLink/Mac	$299[5]	I	4800[6]	2400[7]	NuBus board
	DataLink Express	$249[5]	E	4800[6]	2400[7]	25-pin RS-232C
Circuit Research	FlexFax 9624	$895	E	9600	2400[4]	8-pin DIN
Computer Friends	LightFax 9624	$399	E	9600	2400[8]	Female DB-25
Cypress	FaxPro	$1099[9]	E[10]	9600	2400	LocalTalk 8-pin
Research Corp.						DIN
Dove Computer	DoveFax NuBus	$599	I	9600	2400	NuBus board
Corporation	DoveFax Desktop	$399	E	9600	2400	25-pin RS-232C
	DoveFax	$999	I	9600	2400	NuBus board
	Networkable NuBus					
	DoveFax	$499	E	9600	2400	25-pin RS-232C
	Networkable Desktop					
Genius	TransFax	$1295	E	9600	NA	25-pin RS-232C
Global Village	TelePort/Plus 2	$325	E	4800[6]	2400	ADB port
Communication						
GVC-Technologies	FMM-4824	$265	E[11]	4800[6]	2400	25-pin RS-232C
	Mini Fax Modem					
	FM-4824	$231	E	4800[8]	2400	25-pin RS-232C
	External					
	Fax Modem					
La Cie	2400 Data & Fax	$250	I	4800[6]	2400	Mac Portable
	Portable Modem					board
Micro Electronic	MET 2400PF	$279	E[11]	4800[6]	2400	9-pin RS-232C
Technologies						
Orchid	OrchidFax	$599	E	9600	2400[4]	25-pin RS-232C
Technology						
Prometheus	TravelModem	$299	I	4800[6]	2400	Mac Portable
Products						board
	ProModem	$299	E	4800[6]	2400	25-pin RS-232C
	2400MFax					
Relisys	Tefax System	$1595	E	9600	NA	25-pin RS-232C
	RA-2110					
STF Technologies	FAXstf	$279	E	4800	NA	25-pin RS-232C
Xecom	NewPort SE	$799	I	9600	2400	Mac SE board
	Fax/Data					
	NewPort II Fax/Data	$899	I	9600	2400	NuBus board
	NewPort SE30	$899	I	9600	2400	Mac SE/30 board
	Fax/Data					
	NewPort MP	$799	I	9600	2400	Mac Portable
	Fax/Data					board
	QuadPort II	$2999	I[12]	9600	2400	NuBus board
	Fax/Data					
Zoom	Zoom/Modem	$219	E	4800[6]	2400	25-pin RS-232C
Telephonics	MX2400S					

[1] E=external; I=internal. [2] In bps. [3] Receives only at 4800 bps. [4] Supports AppleFax 9600-bps data-transfer mode. [5] Fax software, $79. [6] Send-only fax. [7] MNP support available as option. [8] Requires optional data-modem module. [9] For networks with TOPS or AppleShare installed; $1199 for AppleTalk networks without file server. [10] Network fax modem. [11] Pocket-size fax. [12] Board provides four 9600-bps fax modems.



MARK JOHANN

The Prometheus ProModem 2400MFax (top) and the FAXstf from STF Technologies (bottom)

WHAT MAKES A FAX MODEM?

Think of a fax modem as a stripped-down version of a fax machine. A stand-alone fax machine is essentially a phone into which you can insert paper. It includes scanning and printing hardware along with a handset and other assorted phone hardware.

Meanwhile, fax modems include only the bare essentials for sending and receiving faxes, namely the electronic circuitry needed to compress, send, receive, and decompress fax information on the phone line. You'll also find some phone jacks and—if it's an external unit—a serial port.

To handle functions such as telephone dialing and management, and preparing a document for transmission, fax modems use software that runs on the Mac. There's no printer built into a fax modem. You can use the fax viewer to read any received faxes, and then you can just throw them away. If you want to print a document, you can do so on a LaserWriter or an ImageWriter.

There's no scanner either; if you want to scan, you can use a scanner already hooked up to the Mac. The InterFax 24/96 and the LightFax 9624 even let you control a scanner directly from the fax software.

The second way to get high-quality output is by installing Adobe Type Manager (ATM). Rather than working with individual font sizes, ATM uses font outlines. The advantage of outlines is that ATM can scale them to any size; you don't need a triple-size font installed in the System file. For fax modems sold without fonts, like the FAXstf, I think using ATM is a much better solution than scrambling around to find triple-size fonts. And even fax modems that come with fonts can still take advantage of ATM; keep that in mind if documents you create have not-so-common font sizes. Of course, if you don't own the outline for every font used in a document, the fax output will be less than perfect. Apple's System 7.0—when released—will use outline fonts, which will make it still easier to get good output from fax modems.

There is still one output caveat, however, and it does not have to do with quality, but with dimensional scaling. Even if you install triple-size fonts or ATM, you may find scaling problems with sent or received faxes, particularly with CAD documents, architectural blueprints, and other graphics. This is primarily because LQ fonts have a resolution of 216 dpi, not 203 dpi. Nor is three times 72 dpi, the Macintosh screen resolution, equal to 203 dpi.

Because of those inequalities, a fax that you receive on a fax modem may look slightly smaller than the original; a fax that you send via fax modem may be larger than the original. The best solution to this problem is BackFax's Exact Size Page Setup option, available with the FlexFax, OrchidFax, and ProModem 2400MFax. This option allows you to send faxes at the exact size the Mac displays them. The quality of the output isn't as high (text, in particular, may suffer from a case of the jaggies), but you know that a 1-inch square in MacDraw will be received as a 1-inch square by a fax machine.

Other Software Considerations

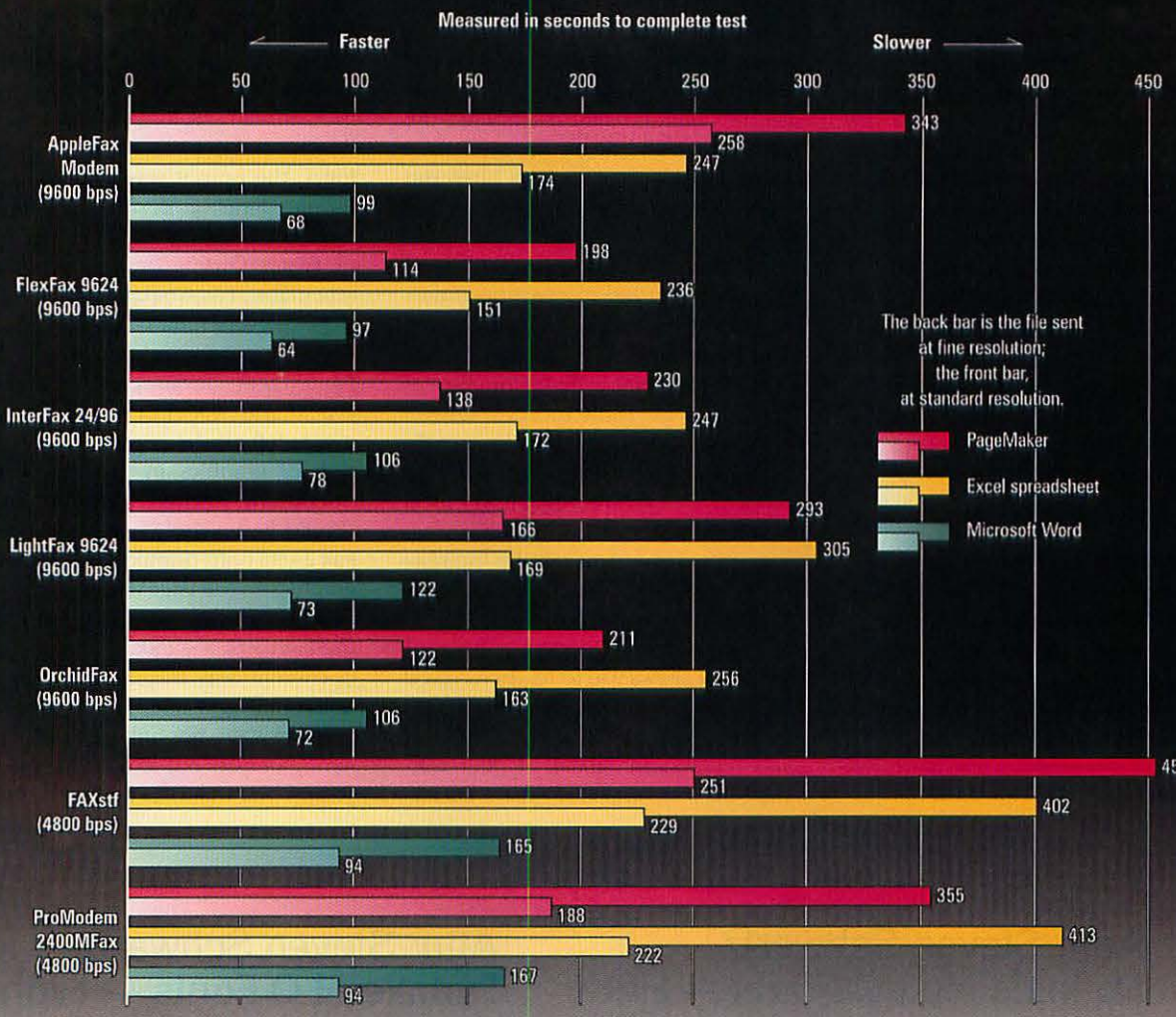
After fonts, I found the most critical fax-modem software feature to be background operation. If fax software won't run in the background, the Mac gets tied up when it sends or receives a fax. Unless you want to dedicate a Mac to fax duties—or you like waiting—I think lack of background operation defeats the purpose of a fax modem. Of the units I tested, three could not operate in the background: the AppleFax Modem, LightFax 9624, and FAXstf. For $245, you can buy a copy of Solutions' BackFax for the AppleFax, which will allow it to operate in the background. However, the standard AppleFax Modem software (which comes with the unit) does not run in the background.

All of the fax-modem software I worked with lets you delay transmission times—say, until after rates go down—to save on phone bills. In addition, the software for all seven fax modems can keep a directory of frequently called fax numbers. Even better, some allow you to keep multiple directories, so you can group numbers by industry or project, for instance.

Occasionally, you may also find it helpful to be able to send the same document to multiple fax machines. Distribution lists enable you to group fax machines by some common criteria that you select. Most fax programs offer this feature.

All the programs I looked at have a redial feature, which is handy if a receiving fax machine's line is busy. The AppleFax modem goes one step further by providing a special redial feature for use when there are transmis-

BENCHMARK TESTING



To benchmark the fax modems, I sent three different documents in both Standard and Fine modes from a Mac IIci. (Speed is more critical to fax senders than to receivers; when you're sending, it's your dime.) The first document was a 30-inch-wide Excel spreadsheet in landscape mode. The second was a 1-page Microsoft Word document formatted in Times and Helvetica. The third was a 3-page PageMaker document with detailed graphics. Benchmarks consist of the time from when the fax machine answered a call to when the fax modem broke the connection.

Among the 9600-bps units, the winner was the FlexFax, which recorded the fastest transmission time in every test. I should note, however, that the triumph is a small one, given the vagaries of telephone connections and the fact that at least one or two units were always close on the FlexFax's heels.

The only noticeably poor performances were recorded by the AppleFax Modem and the LightFax 9624. The AppleFax had serious trouble with the Excel transmission for two reasons. First, the AppleFax won't let you set a custom page-length for a fax. Instead of printing the fax as a continuous 30-inch document, it printed it in three separate pages. Second, when the AppleFax converts a spreadsheet to fax format, the size of the document really expands; in fact, the AppleFax document was twice as tall as the documents sent by other fax modems. More graphics data makes for longer transmission times. The LightFax, meanwhile, did poorly with the high-quality fax of the PageMaker document, taking about a minute longer than the other units, and had similar problems with the Excel file.

The two 4800-bps units showed similar times for the Word and PageMaker documents. The Excel file, however, was a different story. Depending on the send quality (Standard or Fine), the ProModem 2400MFax beat the FAXstf by almost a minute or more.

sion errors. On redial, it automatically resends only the pages that were not successfully received in the prior transmission.

A fax log is a running record of faxes that have been sent and received by the fax modem. Although all seven units have this feature, I found that logs vary widely in the clarity, readability, and amount of detail they offer. My favorite is the log kept by the InterFax software. It automatically records each successful transmission or reception and pertinent information in a simple, uncluttered fashion: date and time, company, number of pages, elapsed phone-connection time, and the name of the fax file. A record of failed fax transmissions appears in a separate window.

Another feature I particularly liked was the ability of some fax programs to attach a default cover page, created from one of several popular graphics programs, to outgoing faxes. Of course, you can always make a cover page of your own and attach it to each fax file, but this built-in feature simplifies the process. Of the seven fax modems I looked at, only the InterFax 24/96 and the AppleFax Modem lacked a cover-page option.

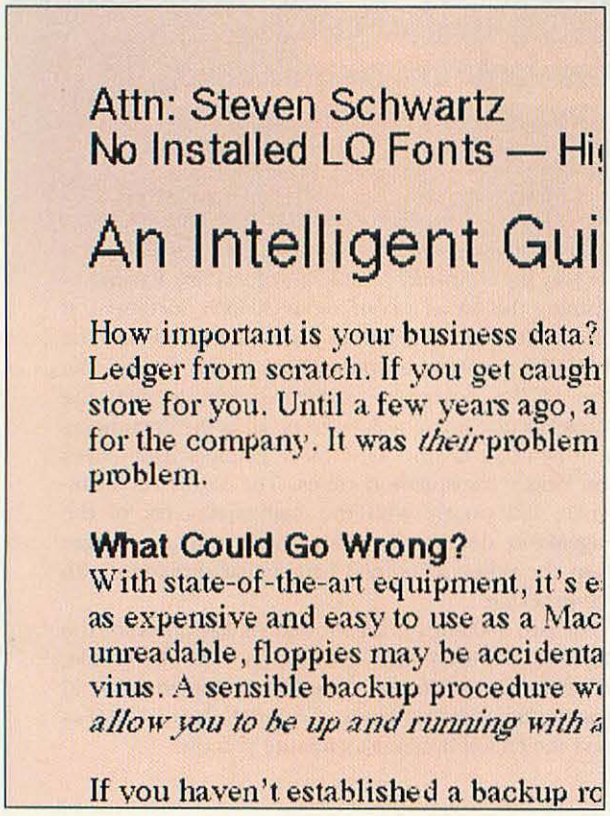
Polling lets a fax modem send documents to and receive documents from another fax with one phone call. The feature makes fax modems more cost effective since the first minute of any phone call is the most expensive; reducing the number of phone calls between fax units by polling therefore reduces your phone bills. I never used polling, but if you decide you want to, the units that offer it are the InterFax 24/96, AppleFax Modem, and the LightFax 9624.

All of the fax modem software I looked at allows you to read a received fax without having to print it. The InterFax 24/96, FlexFax 9624, OrchidFax, and ProModem 2400MFax offer software that converts TIFF files to fax format. Others can variously convert to and from PICT, MacPaint, EPS, Glue, or text formats.

Quality Test Results

When I evaluated the output from each fax modem, I noticed one common thread. As long as the fax-modem package included letter-quality fonts, the output was very good. Although Fine or Best Quality sends were the clearest, even the Standard or Faster Quality options produced acceptable, easy-to-read faxes.

Not everything was perfect, however, especially with the Excel and PageMaker documents. With the FAXstf, the header of the Excel documents fell off the page, and one section of graphics in the PageMaker document printed lighter than it should have. The FlexFax and InterFax 24/96 both printed one section of graphics in the PageMaker document lighter than they should have. Using the LightFax, a standard-quality Excel document was missing every other horizontal grid line, and PageMaker graphics were not only printed at the wrong density but also missing small pieces. The Excel document transmit-

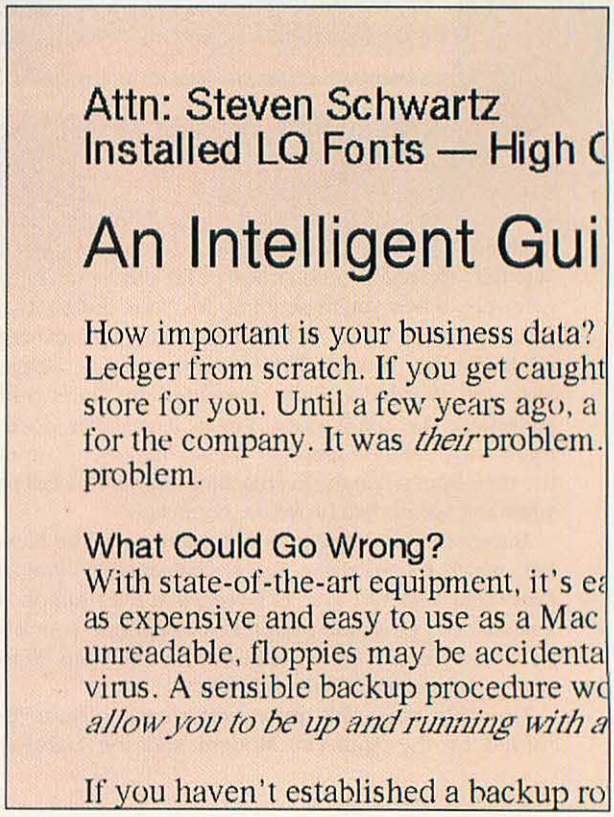

Attn: Steven Schwartz
No Installed LQ Fonts — Hi

An Intelligent Gui

How important is your business data? Ledger from scratch. If you get caugh store for you. Until a few years ago, a for the company. It was *their* problem problem.

What Could Go Wrong?
With state-of-the-art equipment, it's e as expensive and easy to use as a Mac unreadable, floppies may be accidenta virus. A sensible backup procedure w *allow you to be up and running with a*

If you haven't established a backup rc


Attn: Steven Schwartz
Installed LQ Fonts — High C

An Intelligent Gui

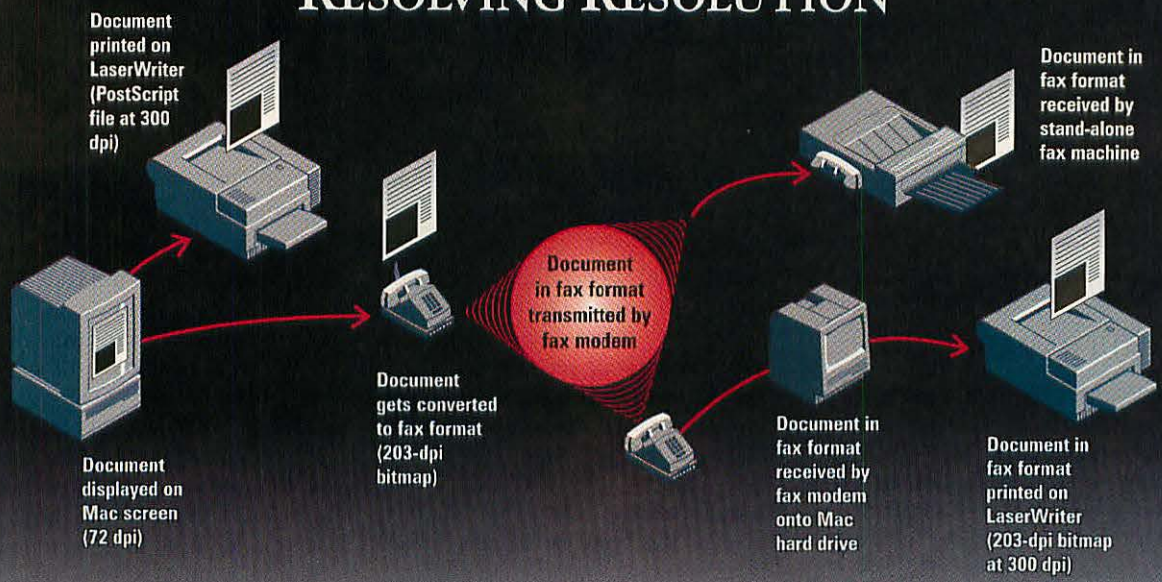
How important is your business data? Ledger from scratch. If you get caught store for you. Until a few years ago, a for the company. It was *their* problem. problem.

What Could Go Wrong?
With state-of-the-art equipment, it's ea as expensive and easy to use as a Mac unreadable, floppies may be accidenta virus. A sensible backup procedure wc *allow you to be up and running with a*

If you haven't established a backup ro

With and Without Both of these faxes were sent at high quality from a fax modem and received on the Sharp FO-550. The detail sample (left) shows what happens when you have neither triple-size LQ fonts nor ATM installed on the Mac. The type is jaggy, and somewhat blurred, but still readable. The other sample (right), which was sent with triple-size LQ fonts installed, is much clearer, especially where type is bold and italicized.

RESOLVING RESOLUTION



Mac screen fonts have a 72-dpi resolution. However, fax machines and fax modems send and receive information at resolutions of 203 by 98 dpi (standard), or 203 by 196 dpi (fine). As a result, to send a Mac document, the 72-dpi screen fonts must be converted to 203 dpi for transmission.

That conversion is the job of the fax software. When you print to the fax modem, the fax driver looks in the System file for an installed screen font that's three times as large as each font used in the document. For example, if all text is formatted in Times 10 and 12, the fax modem software looks for Times 30 and 36.

If the fax modem software finds those sizes of screen fonts, it compresses them by a factor of three and sends the document to the receiving fax station, where the fonts are printed at three times their original screen density. If the fax software doesn't find the large fonts, it does the next best thing—which, unfortunately, is none too good. It attempts to generate the three-times font by scaling the one found in the System file. The results can be less than optimal (see "With and Without").

ted with the ProModem 2400MFax was also missing some dots. Only the AppleFax Modem and the OrchidFax produced all documents without a problem.

It's important to note that none of these output errors rendered a document unusable. But if you are expecting consistently perfect output from a fax modem, you will probably be disappointed.

Best of the Crop

After all of this, I've decided that the price and convenience of a fax modem more than make up for any trials and tribulations they cause. I haven't yet made my final fax-modem decision. I have, however, been able to remove several units from my shopping list.

The AppleFax Modem, the LightFax 9624, and the FAXstf have been eliminated from the running because they do not work in the background. (Of course I could always buy BackFax, but I think that paying more money on top of the $699 AppleFax Modem price is asking a bit much.) The AppleFax gets two strikes, in fact, because its current price is not competitive for a fax modem that offers no data-modem capabilities.

Some people may not want to receive faxes with a fax modem, but I do. So, that eliminates the ProModem 2400MFax, even though it's attractively priced. I also want to transmit faster than 4800 bps. (I may go back to Prometheus because it's about to release a 9600-bps unit.) I am impressed by the speed of the FlexFax 9624, but I find switching between fax and data modes too cumbersome; the FlexFax is also more expensive than the other units tested.

That leaves me two choices: the OrchidFax and the InterFax 24/96. The OrchidFax performed all tests flawlessly and was usually a bit faster than the InterFax. Still, the InterFax includes MNP error-control and compression in data mode—extremely useful for sending and receiving large data files. As far as I'm concerned, either one is an excellent choice. ■

See *Where to Buy* for contact information.

Steven Schwartz *has been writing about Apple II and Macintosh products for 12 years. He was the original editor of* Software Digest, *and is currently the director of technical services for Funk Software.*

REVIEWS

8-bit Paint and Draw Program

ULTRAPAINT 1.0

Pros: Inexpensive; reads and writes to most graphics formats; has open architecture; provides excellent printouts; interface is thoughtfully designed. **Cons:** Inarticulate manual; some features hard to figure out; certain operations are slow. **Company:** Deneba Software. **Requires:** Mac Plus; System 6.0.2; second disk drive. **List price:** $199.

At one time, a Mac graphics program was judged by its feature count: SuperPaint, with a drawing (object-oriented) layer, was thought superior to MacPaint; PixelPaint, with color, was even better; PixelPaint Professional, with 32-bit color, was better yet. But nowadays, just counting features has become unpopular among some people. Better to write a program that does one thing well, the reasoning goes, than to write a mediocre program purporting to be an all-in-one solution.

What, then, should you make of UltraPaint? In its design, feature count was clearly paramount. UltraPaint offers many more black-and-white paint features than SuperPaint, almost all of PixelPaint's color tools, a superset of MacDraw II's object-oriented features, and the gray-scale prowess of Digital Darkroom. All this comes in a single program for less than half the price of PixelPaint or Digital Darkroom.

Layers and Icons

Imagine that you can superimpose three Macintosh windows. In the first, you're running PixelPaint, where you can create 256-color paintings with stunning graduated fills, fancy special effects, and sophisticated color palettes. In the next window (superimposed on the first) you're running MacDraw, an object-oriented program offering laser-quality text, commands for grouping and aligning, and an extensive ruler-and-grid system. Finally, in a third window, imagine Canvas, an object-oriented program that lets you use painting features (spray can or paintbrush) to shade the MacDraw-type objects you create.

That's the principle of UltraPaint—drawing and painting together. Each type of graphic—Painting, Drawing, and Composite—is a separate layer; you see through them as though they were on sheets of acetate. There's only one Painting layer—the back layer—but you can superimpose up to seven Drawing or Composite layers on it in any order. Surrounding the graphics window are floating palettes containing colors, patterns, tools, and so on.

Now things get complicated. In order to cram these hundreds of features into UltraPaint, the developers have hidden each tool's settings and options behind its palette icon. Sometimes clicking on an icon springs a pop-up menu; sometimes a dialog box appears when the tool is double-clicked. Tiny icons-within-icons on the palettes hint as to whether you should click for a pop-up, double-click for a dialog box, or both. There's no question: UltraPaint is no match for MacPaint in simplicity.

Swiss Army Knife

There is, however, a silver lining. For every tool that's been complicated by feature-mania, UltraPaint's technology makes other aspects of the Mac artist's life easier. Primary among these advantages is the fact that UltraPaint really *is* an all-in-one program: you don't have to know whether the file you're opening is a MacPaint, PICT, PICT2, TIFF, or MacDraw file. Indeed, you don't even have to know what those designations mean: if it's a graphics file, UltraPaint will open it (except PostScript graphics files).

Another example of UltraPaint's behind-the-scenes beneficence: when you're working in the program's Painting layer, the screen displays the same squiggles, ragged text, and dotty spray paint you'd see in any other paint program. However, if you've told the program you plan to print on a laser (or other 300-dpi) printer, UltraPaint secretly creates 300-dpi, high-resolution artwork with every stroke of the mouse. In other words, UltraPaint's



Ultra Flexible
All eight floating palettes can be moved, closed, and reshaped. This picture shows the advantages of UltraPaint's integrated approach: the cube is a MacDraw-type object, but given a graduated fill. A masking feature was used to protect the paint from spilling outside of the cube's boundaries.



DAVID RUMFELT

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bitmap layer stores four times more information about your artwork than other paint programs, and the crisp laser printouts prove it. In fact, because UltraPaint's Painting layer can be in 8-bit color, this feature makes UltraPaint the least expensive 300-dpi color paint program on the market—by several hundred dollars.

UltraPaint's biggest long-term benefit, however, is its open architecture: many of its features come in the form of external files. You drop them into the UltraPaint folder and they're automatically installed in the program. They're similar to SuperPaint's "plug-in" tools, except that UltraPaint's external tools are tool icons as well as menu commands, file-format filters, and so on. In the unlikely event there's some feature—somewhere—that UltraPaint now lacks, you'll be able to install new features over the coming months without having to upgrade to a new version of the program.

No Manual Transmission

Alas, the UltraPaint manual is ultra-disappointing. It's not enough that it comes in 30 out-of-sequence sheaves you have to assemble yourself. Once you've done so, you get hundreds of italic-saturated pages that describe features without even hinting at their possible artistic applications. Even when you can glean the intended meaning, you may wince at the prose: "Drag the mouse in the direction opposite that which you want the curve to grow in." Or you might have to play Find-the-Verb: "To add edit points to a freeform by double-clicking on it to enter the edit mode." Deneba's failure to articulate is ironic, in that its flagship programs include a spelling checker and a thesaurus.

All Together

Because UltraPaint is such a universal graphics editor, and because its price is so low, you'd think it would be a great choice for beginners. However, only experienced hands will understand UltraPaint's opaque manual; terms like Not Bic, Xor, and Pix map are never defined.

For artists with some experience, or for people who can store Deneba's help line (800/622-6827)—which doesn't appear in the manual—in their auto-dialing phones, UltraPaint might be the answer. In fact, it does a lot of things well. As advertised, the program is inexpensive; powerful enough to be good at black-and-white, color, and gray-scale bitmap editing; complete enough to include a strong MacDraw-type layer; and, yes, feature-laden enough to trounce SuperPaint. And UltraPaint's open architecture hints that it might remain the feature-count leader for years to come.—**David Pogue**

See **Where to Buy** *or circle 869 on reader service card.*

★

Integrated Software

RAGTIME 3 3.04

Pros: Elegant and powerful integration of modes; good facility for building automated templates and forms; lets you link spreadsheet cells from within text and other spreadsheets; supports many languages; robust spreadsheets; easy and powerful graphing; good graphics support; lets you scan from within program. **Cons:** No footnotes, table-of-contents, index, or outline generator; limited drawing tools; weak typographics; no style sheets; lacks rulers and ruler guides for page layout. **Company:** RagTime USA. **Requires:** Mac Plus; 2MB RAM; hard disk. **List price:** $599.

You may well have heard of RagTime, which is very popular in Europe and has had its distribution arrangements fall apart twice before in the States. With RagTime 3, MacVonk (the Dutch creator) has addressed this problem by setting up a United States subsidiary to publish the product.

At first glance, RagTime 3 looks like a page-layout program with spreadsheet and graphing features. You do all your work on pages, which scroll down the screen like a film strip, and you can zoom in and out as in page-layout programs. When you get to know RagTime, though, you realize it's like integrated programs such as Microsoft Works, but more integrated. The best moniker for RagTime might be "a business-document processor." It offers most of the tools business users need to produce reports, proposals, memos, newsletters, and reasonably complex, "intelligent" forms.

There are five modes in RagTime—the basic page-layout mode, in which you create frames to contain text, spreadsheets, graphs, and pictures—and modes for working with each of those frame types. The menus and tool bars change depending on which mode you're using. Unlike Works, which requires you to change between modes to copy and paste elements into the word processor, RagTime puts everything right on the page. If you click on a spreadsheet frame, you're in

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spreadsheet mode. Click on a text frame and you're in text mode.

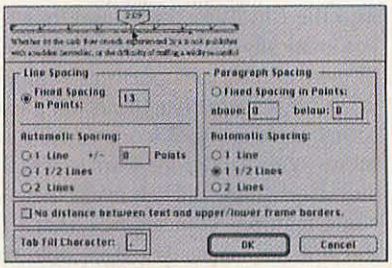
You can link information in a spreadsheet frame from any point in the text or another spreadsheet, so when the first spreadsheet changes, the reference is updated. Charts also update automatically when their source spreadsheets change. These are not warm links. They're hot.

Frame creation is simple and intuitive, though it would be greatly improved by rulers and guides as in most page-layout programs. To create a frame you just draw a box (sorry, rectangles only) with the frame tool and decide what type of frame it is. You can also draw lines, but no circles. Frames can have rounded corners, lines can have arrowhead ends, and any line or box can have a drop shadow (there's no control over the appearance of arrowheads and shadows, however). Options let you wrap text around frames, make frames transparent, and anchor frames to text so they move when text reflows.

You can build very complex pages and save them as Forms, so you can simply "tear off" a new form when you need one—great for sales and expense reports, calendars, and the like.

Text Editing and Formatting

The basic frame, not surprisingly, is the text frame, in which you can enter and format text. It's unfortunate that, despite its impressive strengths in other areas, RagTime's word processing (arguably the most important feature) is somewhat lacking. It's competent, but far from top-flight. It provides search-and-replace, a spelling checker, and hyphenation in more than half a dozen languages (most dictionaries haven't been released yet in the United States), but there's no index or table-of-contents generation, footnoting, figure numbering, or outlining, and sorting is available only within spreadsheets.



Rulers That Talk to You

RagTime's rulers determine paragraph formatting. You can adjust indents and tabs by dragging with the mouse and change line spacing via the Ruler dialog box.

RagTime offers the basics in text formatting, with all adjustments in full-point increments (except manual kerning, which works in quarter points). Character format includes custom sizes up to 999 points, fractional spacing, colored and tinted type, condensed and expanded type (which actually just alters letter spacing), and adjustable subscripts and superscripts. You can build all of these attributes into a Type Macro so they're easy to apply, and you can search for and change character formats throughout a document. Though these features come close, they aren't as powerful as true style sheets, because they don't affect paragraph formatting.

Paragraph formatting is accomplished through rulers in the text that apply to all ensuing paragraphs, up to the next ruler. The rulers let you control leading (fixed or automatic, in 1-point increments), alignment (left, right, center, justified), left and right margins, first-line indents, and tabs (right, left, center, and decimal, with or without leader characters of your choice). You can cut and paste rulers and adjust attributes for the current ruler or all following rulers. The rulers are quite small, but an ingenious pop-up measurement tells you where indents and tabs are positioned as you drag them.

RagTime imports graphics in all the usual formats—PICT, EPS, MacPaint, and TIFF (including gray-scale and 24-bit-color TIFF, within memory limits). You can size and crop as you'd expect in a page-makeup program, apply colors to black-and-white art, and adjust gray and color levels for multibit TIFF images.

The Numbers Game

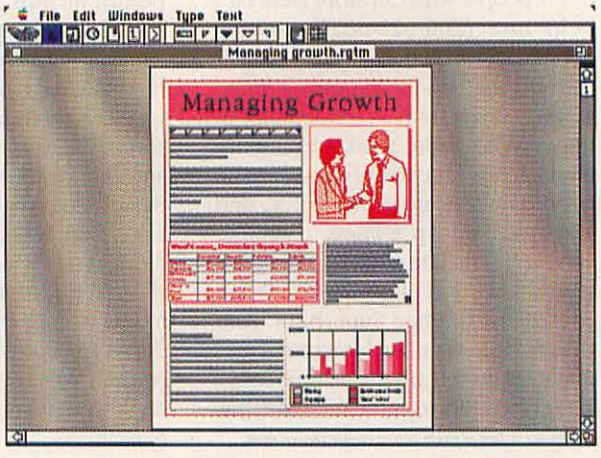
RagTime's spreadsheet mode offers impressive powers, with many or most of the features of, but somewhat less speed than, stand-alone spreadsheets like Excel and Wingz. You'll find a heady array of arithmetic, logical, scientific, date, data, and financial functions. There's a Button function that lets you turn a cell into a functioning button that is activated when you click on it. Even mail merging is accomplished through functions in spreadsheets.

A special type of cell—Wraparound Text—lets you type running text in a cell without using carriage returns and constantly adjusting the cell height manually. You can format text within a wraparound cell just as you can other text; you can even use paragraph rulers.

The most important feature of RagTime's spreadsheets, though, is that they are live, right on the page, and you can reference values in those spreadsheets elsewhere in the document, or even from other RagTime documents. For the bulk of business documents, RagTime's spreadsheet powers are ample.

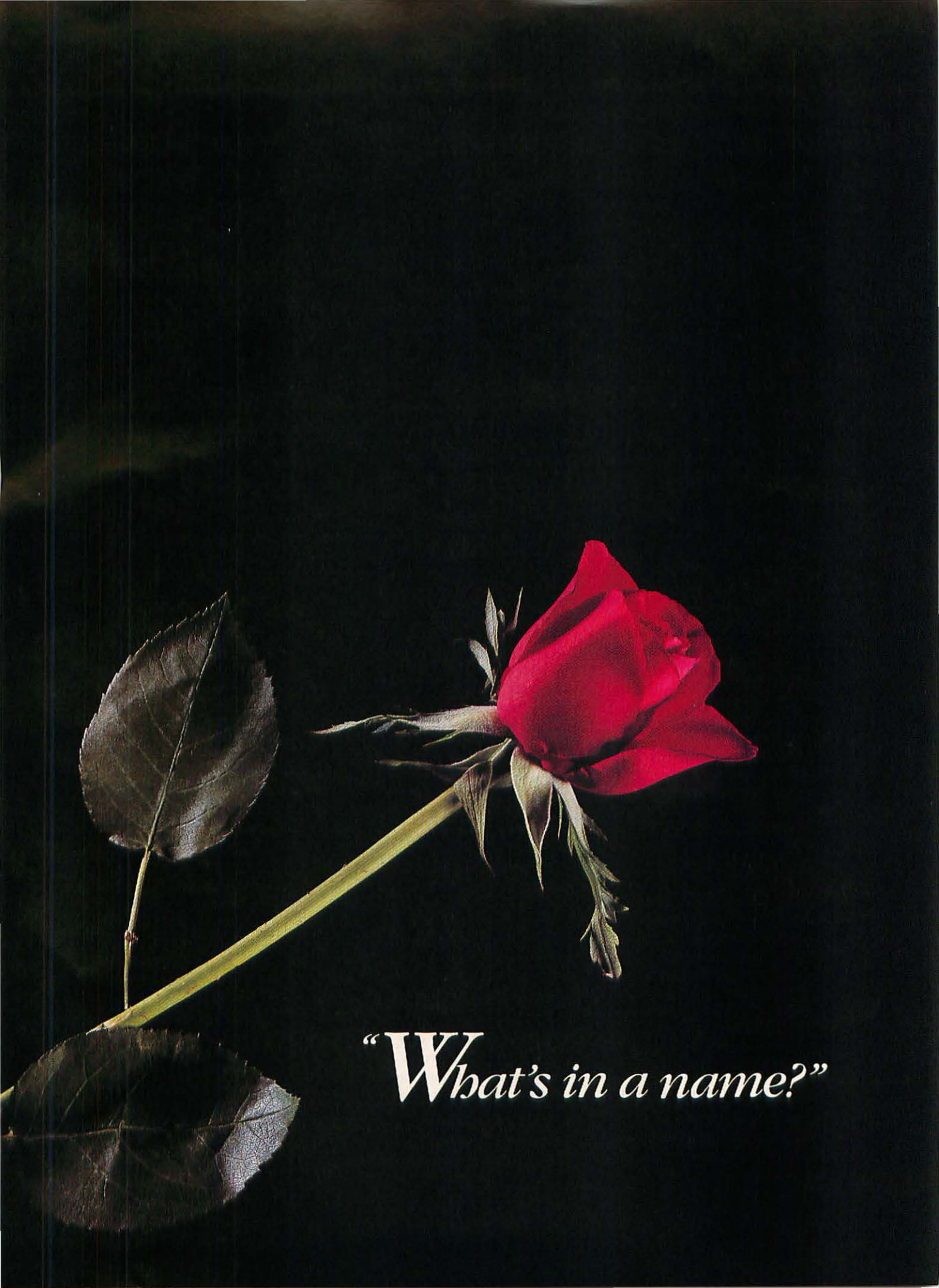
To build a graph based on spreadsheet data, you simply select the cells you want to graph and paste them

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Living Pages

RagTime lets you build pages with text graphics, live spreadsheets, and graphs, all of which can be edited right on the page.


"What's in a name?"

into a graph frame. While you're limited to bar, pie, and fever graphs, there are many controls for each graph and that gives you a lot of flexibility. Change values in the source spreadsheet, and the graph changes accordingly (you can also freeze the values for the graph).

Printing

One of RagTime's best features is its strong support of multiple paper bins on specific printers. You can print the first sheet from one bin (letterhead, for instance) and ensuing sheets from another bin. You can print alternating pages for two-sided printing, with good control to allow for paper-feed variations between printers.

RagTime is not quite as strong as its competitors that specialize in one area, for example, word processing; but its combined strengths, particularly in page layout, put RagTime well beyond Microsoft Works and its ilk for most business users. Works still wins for its database, which is much easier to use than RagTime's spreadsheet data functions, for mail merging, and for drawing tools; but RagTime is much better at assembling complete, live documents. If you only want to learn one program and you need spreadsheets, graphs, graphics, basic word processing, and reasonable page-makeup tools, take a close look at RagTime 3.—**Steve Roth**

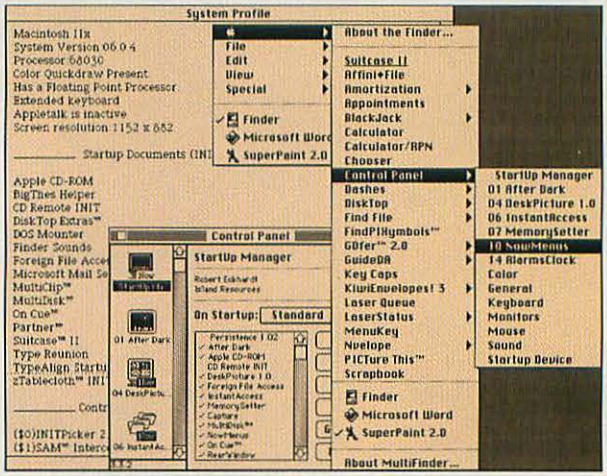
See **Where to Buy** *or circle 831 on reader service cards.*

Utility Collection

NOW UTILITIES

Pros: Wide range of system-enhancement utilities; several unique programs not available elsewhere. **Cons:** A few unsquashed bugs in initial release; some utilities are not as powerful as (sometimes more expensive) alternatives; quality of manual is uneven. **Company:** Now Software. **Requires:** Mac Plus; System 6.0.2. **List price:** $149.

If you're shopping early for Christmas, Now Utilities would be a good choice for a software stocking stuffer. A potpourri of system enhancements, this collection of 12 programs really does have something for everyone. Some of the programs are based on classic shareware utilities, some are direct competitors of other commercial utilities, and some are concepts seen on the Mac screen for the first time.



StartUp Manager **Now Utilities' StartUp Manager reorders INITs by prefixing INIT names with numbers, often creating chaos out of alphabetical order in the Control Panel itself and in the Control Panel submenu, shown here on a NowMenus pop-up menu. (Profiler document is in the background.)**

Clearly in the recreational category are DeskPicture and WYSIWYG Menus. WYSIWYG Menus is an INIT (start-up document) that causes all font menus to display each font name in its own typeface and causes size and style menu options to appear in the named size and style in the currently selected font. WYSIWYG Menus is similar to Dubl-Click's MenuFonts 3.0 ($59.95), but WYSIWYG Menus is less versatile and much slower in generating a lengthy font menu. The DeskPicture INIT replaces the desktop pattern with the black-and-white or color PICT graphic of your choice. Like Microseeds Publishing's ColorDesk (included in the Screen Gems disk, $79), DeskPicture can display a graphic in its actual size or stretch it to fill the entire screen. Unlike ColorDesk, DeskPicture allows you to assign a different picture to each monitor in a multimonitor setup, to select either the graphic's own color table or the System's standard color table, and to rotate randomly between pictures in a folder. Ideally, DeskPicture would work with any monitor setup; the initial release version, however, is incompatible with some Radius monitors.

At any spot on the screen, whenever you click the mouse button and press a user-defined key combination, the NowMenus INIT (like the closely related freeware HierDA) creates a pop-up menu for the current application. In the Finder, desk accessory menus can also appear as submenus to the Apple menu (so you can open a desk accessory and select a command in a single step), and Control Panel devices can be listed in a Control Panel submenu (so you can go directly to a specific panel). Although it's less powerful than Advanced Interface Programming's TOM/INIT ($59) (which creates both tear-off and pop-up menus), NowMenus is more polished and easier to use, and it's a real wrist-saver on large screens.

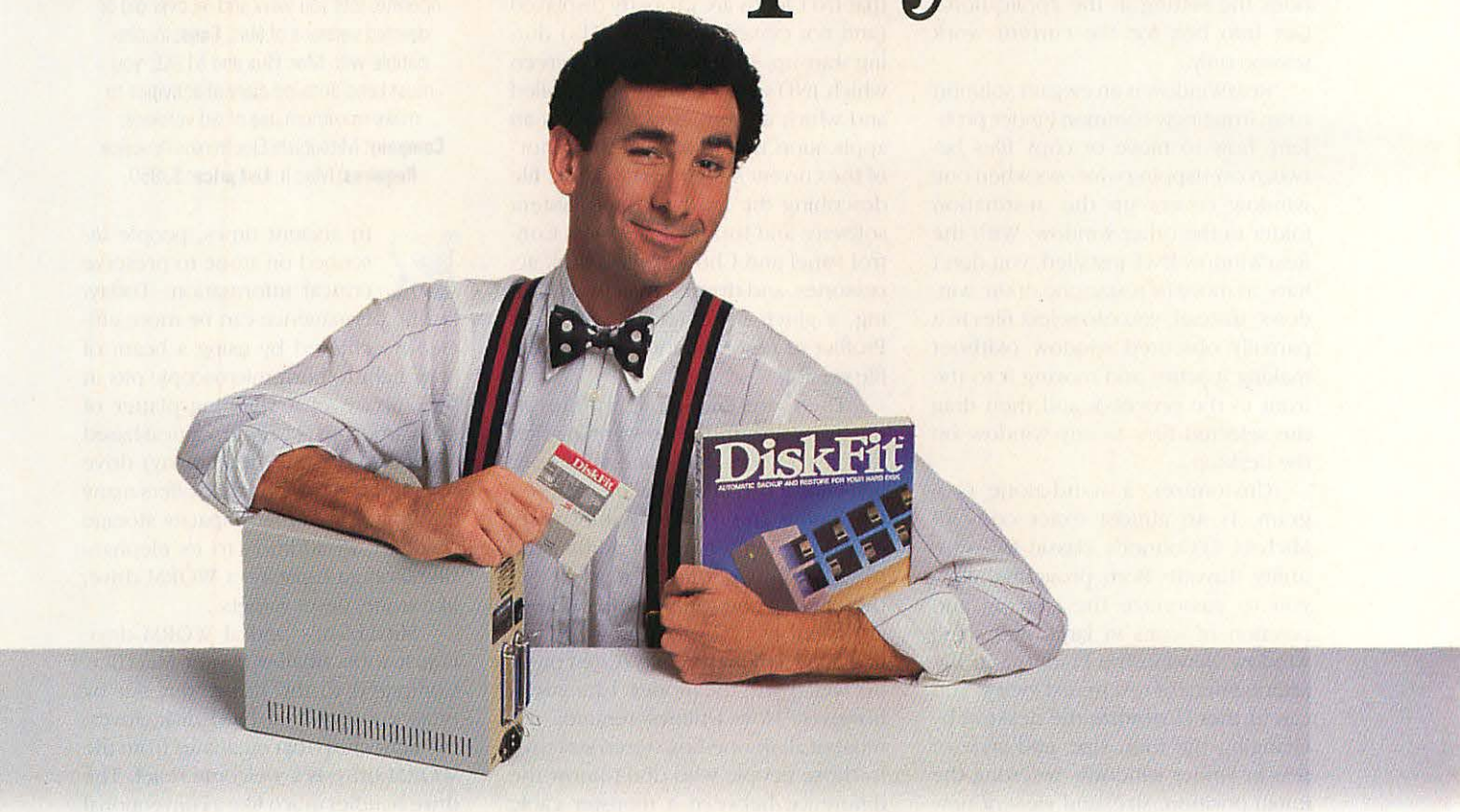
The AlarmsClock INIT combines a SuperClock-like menu-bar clock and Smart Alarms–like electronic alarms. The clock appears in the upper-right corner of the menu bar in the font and size of your choice; a mouse-click displays the date. In the Control Panel, you can set up one-time-only or recurring alarms that beep, flash, and/or display a message in the menu bar. The variety of alarm options is less than in Smart Alarms, however, and on a large screen it's easy to overlook the menu-bar message.

Like Aladdin Software's Shortcut ($79.95), the InstantAccess INIT adds a pop-up menu to all Open and Save dialog boxes; the pop-up menu contains a list of often-needed folders, so you can quickly move from folder to folder. Unlike Shortcut, InstantAccess's list also displays the ten most recently opened folders. But InstantAccess also differs from Shortcut by not displaying lists of all mounted disks or commonly needed files, and not letting you create new folders or locate lost files.

The MemorySetter INIT allows you

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Circle 382 on reader service card

to specify an application's MultiFinder partition as the application is launched. The MemorySetter dialog box displays information about current RAM usage and the memory requirements of the launching application; the partition size you enter in the dialog box overrides the setting in the application's Get Info box for the current work session only.

RearWindow is an elegant solution to an irritatingly common Finder problem: how to move or copy files between overlapping windows when one window covers up the destination folder in the other window. With the RearWindow INIT installed, you don't have to move or resize one of the windows; instead, you can select files in a partially obscured window (without making it active and moving it to the front in the process), and then drag the selected files to any window on the desktop.

Customizer, a stand-alone program, is an almost exact copy of Michael O'Connor's classic freeware utility, Layout. Both programs allow you to customize the spacing and position of icons in large and small window views in the Finder, and the arrangement of text in text views. You can further customize the desktop by changing the font, size, and style of text in Finder windows, resetting the initial position, size, and view of new windows, and so on.

Print Previewer is a Chooser document that allows you to print documents to the screen so you can see how they look without wasting paper. You can preview one or a few pages, or the entire document; Print Previewer displays each page in a fit-to-window size, and if that's too small, Print Previewer can switch to actual size. An accompanying F-key conveniently allows you to switch between your usual printer driver and Print Previewer with a simple keyboard command.

Three final programs can be quite helpful in diagnosing and resolving INIT conflicts and other problems. Much like Microseeds Publishing's INITPicker 2.0 ($69), Now's StartUp Manager allows you to turn INITs on and off, organize them so they load in something other than alphabetical order, create and load INIT sets for specific purposes, and interrupt the start-up process in order to change the choice or order of INITs to be installed. (Unfortunately, StartUp Manager doesn't allow you to make one-time-only changes to an INIT set at start-up.) The Persistence INIT ensures that INIT icons are properly displayed (and not erased by other INITs) during start-up, so you can see on screen which INITs are successfully installed and which are not. And Profiler is an application that creates a "snapshot" of the current system setup: a text file describing the hardware and system software and listing of all INITs, Control Panel and Chooser files, desk accessories, and drivers. (As of this writing, a glitch in System 6.0.5 causes Profiler to report an incorrect System file version.)

There are enough substitutes in the freeware and shareware market that if you combine them with your first choice of commercial utilities, you still come out ahead money wise. However, some network administrator may find getting a manual (although this one can be rather obtuse at times), tech support, upgrade notices, and a more carefully tested product well worth the money. Ultimately, however, Now Utilities reminds me most of all-in-one-box stereo systems; to those people who don't know the difference between a monster cable and a subwoofer, prepackaged stereos sound pretty good, are easy to assemble, and cost far less than a component system. Similarly, Now Utilities offers a wide range of basic system enhancements, contains a well-integrated set of programs, and costs less than a hand-picked collection of top-of-the-line utilities.

For me, I would go out and get the freeware I want and pay for commercial packages, such as INITPicker. For Mac owners who don't know the difference between a cdev and a SCSI terminator, the Now Utilities collection is an excellent system-enhancement choice. Be careful, however. Just as prepackaged stereos turn many unsuspecting listeners into discriminating audiophiles, Now Utilities could well convert once-content average Mac owners into eager utility-philes.

—Robert C. Eckhardt

See *Where to Buy* or circle 798 on reader service card.

Optical WORM Drive

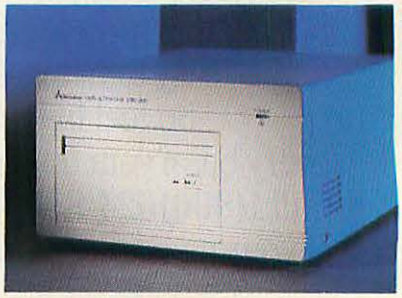
MITSUBISHI OPTICAL WORM DRIVE

Pros: Relatively speedy and easy to operate; lets you view and recover old or deleted versions of files. **Cons:** Incompatible with Mac Plus and 512KE; you must keep detailed diary of activities to make maximum use of old versions.
Company: Mitsubishi Electronics America.
Requires: Mac II. **List price:** $3850.

In ancient times, people inscribed on stone to preserve critical information. Today, lasting permanence can be more efficiently achieved by using a beam of laser light to burn microscopic pits in the surface of a spinning platter of polycarbonate plastic. An optical-based WORM (write-once-read-many) drive operating on this principle offers many advantages as a high-capacity storage medium. In addition to its elephantine storage capacity, a WORM drive, like stone, never forgets.

Mitsubishi's optical WORM drive is just a bit smaller than a Mac IIcx. Compared to the racket put out by most conventional hard disk drives, the light chirp that emanates from the WORM drive is a welcome relief. The drive handles much like a conventional hard disk, with an access time of about 50–80 milliseconds (Mitsubishi claims an average 1/3-stroke seek time of 50ms). This is about half as fast as a Syquest 45-megabyte cartridge-based drive. Although the WORM drive is noticeably slower than a fast hard disk of similar capacity, the WORM drive's laser platter is enclosed in a replaceable cartridge. Each side of the cartridge holds about 288MB, so that two

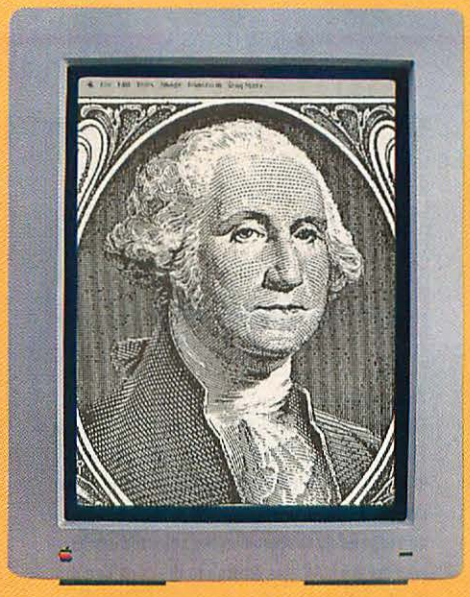
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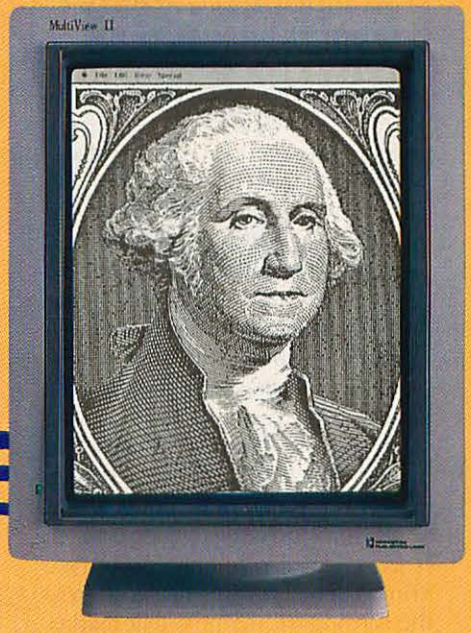


MARK JOHANN

Mitsubishi Optical Worm Drive

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PPL MultiView II	$555 monitor $440 adapter	15"	Flat	P4	80 dpi 640x870	analog up to 16 with FPDA	75Hz	One Year	Yes	B	Yes

PPL offers an optional Anti-Reflective Panel for $75.

FPDA (Apple Full Page Display Adapter).

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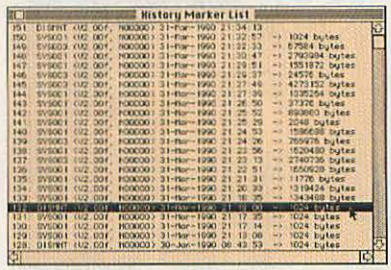
cartridges equal a little more than a gigabyte. Since most users will use a WORM drive to archive data, I timed how long it took to transfer the contents of a completely full 45MB Syquest drive to the WORM drive. Using a Mac II, the Finder-mediated transfer required 12 minutes, a time that compares very favorably with what would be required for a similar backup to tape or floppy disks.

Corel Software

A software-based device driver from Corel enables the Mitsubishi drive to function just like a conventional drive on which files can be deleted and overwritten. Since the process of writing data irreversibly alters the optical disk, files written to the disk cannot actually be changed or deleted. However, you can trash files from the Finder in the normal fashion. Although such files effectively vanish, they remain on the disk; through the use of provided software, they can be easily and reliably recovered. The most irksome anomaly is that the Macintosh Operating System is not made aware that the space used by deleted or old versions of files cannot be recovered, so the Finder doesn't always report an accurate count of the space left on the optical disk cartridge. To keep the Finder up-to-date, you need to run the Worm Tools utility periodically and force an update of the space that's actually available. In addition to the device driver and recovery utilities, Corel provides a collection of other software for tasks like formatting new disks and diagnosing potential problems in the Mac's SCSI interface, the connecting cable, or in the drive mechanism itself.

Time Travel

Corel's OptiStar software for the Mitsubishi drive comes as close to providing a Time Travel menu option as any Mac application to date. Using the History Marker option in the Operation menu of the Worm Tools utility, you can step back in time and magically transform a cartridge to appear as it did in the past, at nearly any point in its entire lifetime. Since the WORM drive cannot physically erase and rewrite data, older versions of files and files that have been "erased" always remain somewhere on the cartridge.



Time Tunnel

The List/Select History Markers function, in Worm Tools, displays a list of all accessible history markers for a cartridge. By double-clicking on an entry you can mount the cartridge in a state corresponding to whenever the selected marker was created. All files written to the cartridge at the time the selected marker was made become available for reading and can be copied to a hard drive or floppy disk. To restore the drive to its current state after using this function you must first dismount and then remount the cartridge.

History markers are files periodically written to the optical disk by the device driver (or at your command using the utility program) that record the organization and location of files on the cartridge at the instant of each marker's creation. The Worm Tools utility can use these files to restore a WORM drive cartridge to the exact state it was in whenever a particular marker was created. Once a history marker is selected from within Worm Tools, you mount the cartridge, which is placed in a read-only mode (see "Time Tunnel"). All the files written to the cartridge at the time that marker was created become available for reading and can be copied to another drive or floppy disk. This feature is invaluable if you frequently generate many intermediate versions of data and are afraid of inadvertently deleting or overwriting them.

One problem is that history markers are only selectable by the date and time of their creation, so you'll need to keep an up-to-date log of your activities to make the system really useful. In order to ascertain the state of the cartridge at the moment of a history marker's creation you have to actually select that marker and remount the drive. If you're unsure of exactly which marker to select, it can take a while to get exactly "when" you want to be.

The capacity of the optical cartridges makes the Mitsubishi drive vulnerable to one of the current Macintosh system's most loathsome shortcomings—the Mac overloads whenever you try to place more than 2727 resources on a single disk. Due to the fact that different files have different numbers of resources, it is very difficult to determine the exact number of files you can safely place on a disk. Unless you're archiving huge files like color graphics or databases, you can easily exceed this limit on a 288MB platter. Using the Worm Tools utility that comes with the Mitsubishi drive, you can at least determine the number of resources in the Desktop file of the optical disk and try to avoid exceeding the limit. Mitsubishi recommends circumventing the problem by partitioning the disk (effectively fooling the Macintosh into seeing the platter as two or more separate drives), using ALSoft's MultiDisk software. However, this software doesn't come with the drive.

Be Cautious

Since data is physically inscribed on the disk with a laser, writing data is an irreversible process. You have to be cautious about launching and running any application that might write a temporary or scratch file to the WORM disk during its operation. A particularly onerous offender is Odesta's Double Helix, which searches for the mounted drive with the greatest amount of available storage space (guess which one that's likely to be if you own one of these drives) and then writes a temporary working file to that disk. Other potential sources of concern are disk-protection packages that might unnecessarily write files to a mounted WORM drive. Unless you specifically want to create an audit trail of every action, a WORM drive is best treated as an archival medium. Mounting a WORM drive when it's needed and unmounting it when it's not needed will go a long way toward ensuring that this enormous but intrinsically finite storage medium is effectively utilized.

Worth Its Weight in Valium

If you accumulate a lot of data and *are* anxious about losing it, Mitsubishi's

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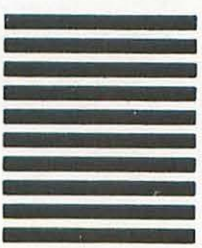


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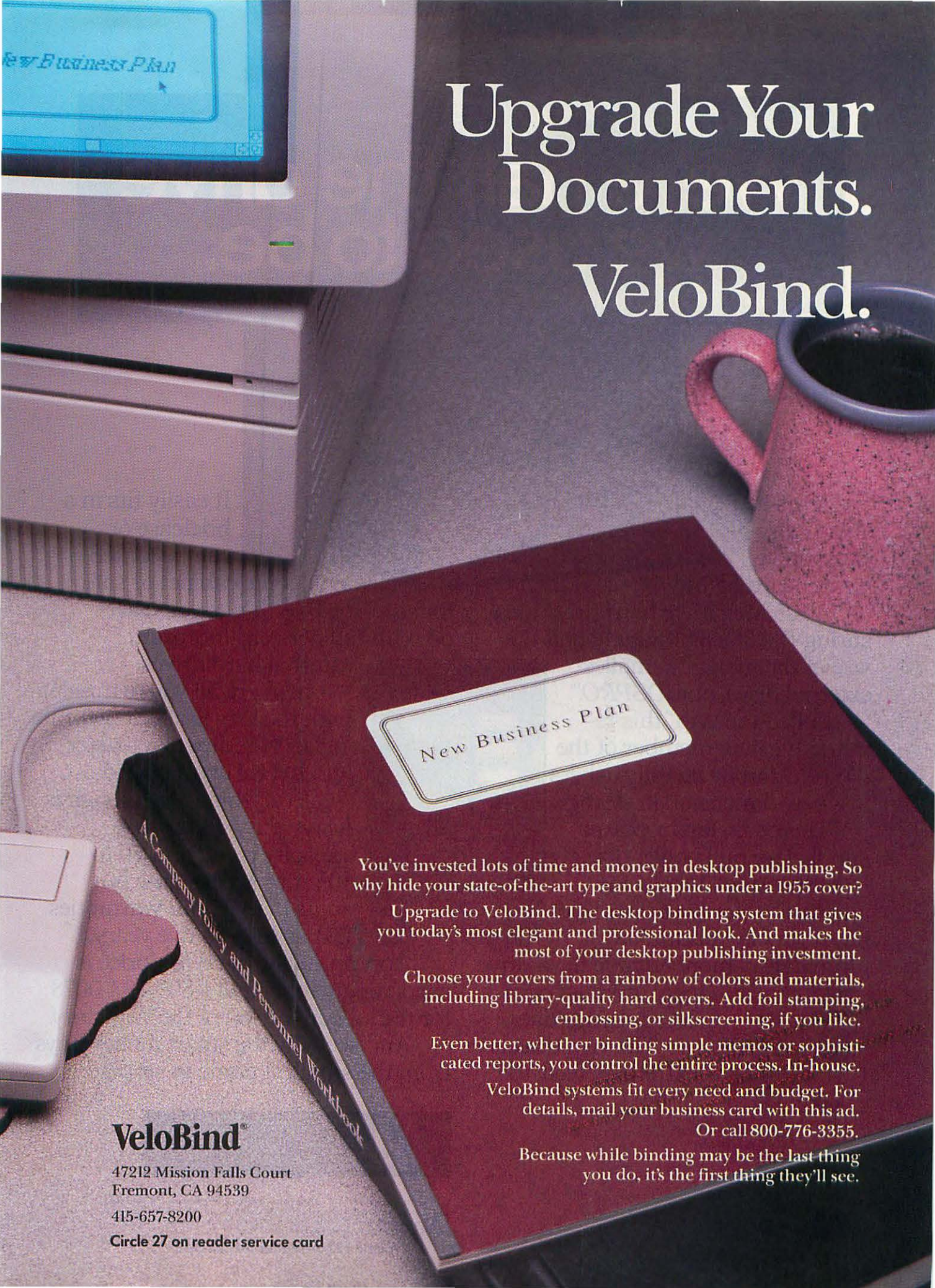
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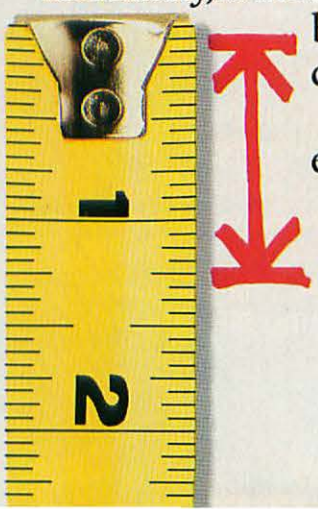
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WORM drive will prove itself worth its weight in Valium. It's a viable high-speed solution for archiving critical information. The drive is admittedly not cheap, but a megabyte of real estate on a laser platter only costs a quarter. Although the cost of securely archiving data is bound to drop in the future, if you can't afford to lose what you have right now, the Mitsubishi WORM drive is a good deal today.

—David L. Foster

See **Where to Buy** *or circle 788 on reader service card.*

Scrapbook-Replacement Utility

MULTICLIP 2.0

Pros: Functional and flexible; clean substitution for standard Scrapbook. **Cons:** Some functionality lost under MultiFinder; minor incompatibilities with certain applications. **Company:** Olduvai Corporation. **Requires:** Mac Plus; System 6.0.2. Hard disk recommended. **List price:** $129.

Every now and then you run across a utility, use it once, and immediately make it part of your standard System configuration. MultiClip is such a program. The concept is simple: what if the Clipboard, that mystical entity holding the last thing you cut or copy, could handle several items at once? An obvious idea, you might say, but one that apparently hasn't occurred to Apple during the last six years. It occurred to someone, though, and Olduvai has it out on the market.

Installing MultiClip is the usual drag-the-icon-into-the-System-Folder routine, followed by a restart. MultiClip is then installed and functioning.

To paste into the MultiClip clipboard, you make a selection of text, graphics, spreadsheet cells, or whatever, then press ⌘-Option-C (to copy) or ⌘-Option-X (to cut). Then you can do this again. And again. And again. There is no inherent limit (at least, none mentioned) beyond the space available on your start-up disk (hence the hard disk recommendation). Each item saved in this manner is known as a ClipFrame.

To paste from MultiClip, you place the cursor in the target location and press ⌘-Option-V. MultiClip then pastes in the first ClipFrame that you earlier cut or copied. If you paste again, the second ClipFrame you cut or copied gets pasted in, then the third, the fourth, and so on. As you cut or copy additional items, they're added to the end of the queue as new ClipFrames. If you paste in all the ClipFrames currently in MultiClip, then the next paste will retrieve the first ClipFrame, and you'll start all over again.

Since you don't always want to paste items in the same order you cut or copied them, MultiClip gives you direct access to individual ClipFrames with the sequence ⌘-Option plus the number (1, 2, 3) of the ClipFrame you want. Or you can bring up the MultiClip window—you'll find MultiClip listed among the DAs in the Apple menu—and look at all the ClipFrames directly.

The MultiClip window gives you a screen within a screen, complete with its own menu bar. Each ClipFrame is represented as a small rectangle that shows part of the item contained. You can delete, copy, and rearrange (by dragging) the ClipFrames in the MultiClip queue. If you're running under the Finder, you can select a particular ClipFrame and paste its contents to the current application, using the Paste In command in MultiClip's ClipFrames menu. Note that this feature doesn't work under MultiFinder, a limitation not mentioned in MultiClip's main documentation (it is buried back in the Troubleshooting section of the appendix).

But wait—there's more. If you double-click on a ClipFrame in the MultiClip window, the ClipFrame Editor appears. If you're working with text, you can actually make changes to the contents of the ClipFrame. For most items, you can select a portion and save it as a new ClipFrame.

How do you get rid of ClipFrames? Simple: bring up the MultiClip window, click on the ClipFrame you want to delete, and select Clear from the MultiClip Edit menu. Or if you're pasting the ClipFrame into a document, you can use the ⌘-Option-R sequence to remove it from MultiClip after pasting it in.

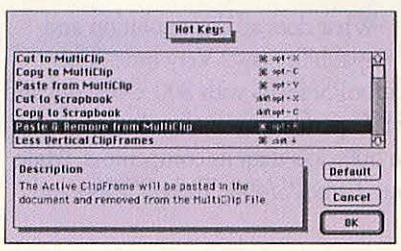
What if you get too many ClipFrames in your clipboard? There are two solutions. First, you can limit the total number of ClipFrames to allow in MultiClip; that way, as new items are cut or copied, the oldest items are automatically removed. Or you can save your entire Clipboard as a separate file, then either start a new Clipboard or read an existing one in.

Recognizing that not everyone might like the particular command sequences used in MultiClip, the developers added two features—a Preferences panel and a Hot Keys panel—to let you redefine just about every command sequence. Two other panels—Options and Layout—let you configure other aspects of MultiClip. Oh, yes—you can also have MultiClip completely replace the standard Clipboard, so that any regular Cut, Copy, or Paste command accesses MultiClip instead of the Clipboard.

The review copy that I received—tested on a Mac SE with a 20MB hard disk, 2.5MB RAM, and System 6.0.2—had a few minor glitches. It wouldn't recognize the ⌘-Option-1, -2, or -3 command sequence. I worked around that by changing the sequence using the MultiClip Preferences panel. Also, Olduvai notes some MultiClip compatibility limitations with specific applications; for example, text pasted into Microsoft Word 3.0x will lose all font and style information, although there's no such problem with Word 4.0. Similar limitations are documented and can usually be worked around; the 100-page manual does a good job of explaining the product in detail.

Even with its minor limitations, MultiClip is a welcome addition to any Macintosh system. Believe it or not, there are even more features, but they'll be left for you to discover on your own.**—Bruce Webster**

See **Where to Buy** *or circle 791 on reader service card.*



Hot Keys Window
The Hot Keys window lets you redefine all the MultiClip keyboard commands.

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Text for the menu was created in PageMaker, saved as EPS files and placed in FreeHand.

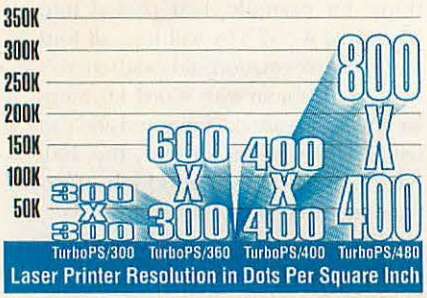
The Images with Impact® clip art illustrations were edited with FreeHand and color was specified in cyan, yellow, magenta and black.

The Apollo logo was created in FreeHand where the various elements were edited and combined.

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Network Program

FLASH 1.0

Pros: Easy to install and use; works in background; no servers needed; requires only one license per network zone. **Cons:** Some error messages hard to interpret; send and receive folders must reside on start-up drive's root directory. **Company:** Beagle Bros. **Requires:** Mac Plus; AppleTalk-compatible network connection. **List price:** Version 1.1 $199.95 per AppleTalk zone.

Moving files across a network no longer requires a centralized file server, like AppleShare, or a distributed file server, like TOPS. With Flash you can move files between Macintoshes across a network in the background and support a chat utility for real-time communications. Produced by Beagle Bros (a well-known Apple II software company making its first foray into Macintosh software), Flash is a useful tool for networked Macintosh users.

Installation consists of moving an INIT and two System documents—AppleTalk Data Stream Protocol (ADSP) and Macintalk—into the System Folder, and using Font/DA Mover to install the Flash desk accessory. You also need to place a folder named Flash Files in the root directory of the system's start-up drive, where individual subfolders named To (name) and From (name) accommodate files sent to or received from other AppleTalk nodes on the network. The name portion of the To and From folders must match the name of the designated recipient in order for Flash to recognize remote nodes. (I struggled with a misspelled node name for about 15 minutes before noticing the cause of the problem—rather than saying the node was not found, the message indicated that the node was not available.)

Flash File Transfers

To transfer a file across the network without interrupting work flow, deposit the file into the correct To folder. You don't have to use the Finder—Flash works equally well using either the Save As command from within applications or CE Software's DiskTop desk accessory.

Dealing with incoming files is similarly easy. Flash opens a dialog box on the desktop to inform the user of an incoming message, the sender's identity, and the name of the transferred file. While the file is being received, you will probably notice occasional slowdowns or balks in the foreground application, similar to when the Print Monitor is sending a file to a LaserWriter. At times, the cursor lags, scrolling is jerky, and the display ceases activity while an incoming file is written to disk. This is not terribly objectionable except during large file transfers.

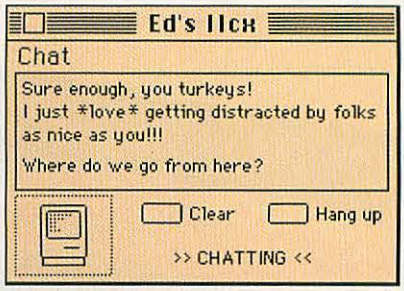
Each Flash user can choose a unique graphic, called a Mugshot, from any graphic source pasted into the Clipboard, that will appear on the dialog box with all messages. This provides the user an opportunity to personalize his or her network identity a bit. The Flash manual includes some humorous examples of Mugshots.

To initiate a Chat session, you must launch the Flash DA and choose the Chat menu option. A dialog box appears on the recipient's desktop. If the recipient has disabled incoming messages, no network dialog can take place. However, if the message comes through and the recipient chooses to chat, he or she opens the Flash desk accessory and selects Answer Chat from the Flash menu; both users can see keyboard input as it is entered. Either user can break the connection by clicking the Hang up button.

Managing the Flash Interface

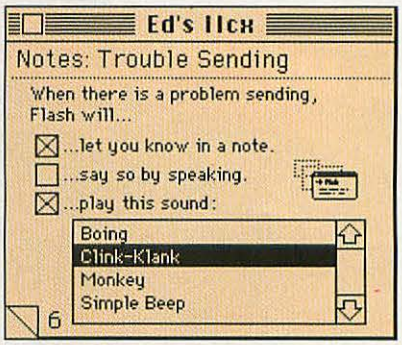
Flash uses a 10-page HyperCard-like notepad to manage aspects of its user interface. This governs the Flash environment and includes the Mugshot; settings for on/off, memory consumption, and local caching; security; disk space; notifications for files sent and received; sending and receiving problems, notifications of files recently received; chatting; and notes.

The notepad approach takes some time to explore and master, but it represents a powerful tool for managing program behavior. One drawback is that access is purely sequential; it would have been better to include a thumbnail metaphor for jumping right to a particular page.



The Chat Window

Chat messages display in real time on both sides of the connection. The Chat window also displays the other party's Mugshot in the lower left-hand corner, as well as Clear and Hang Up buttons. The double-bracketed string >>CHATTING<< shows that the Chat window is currently in use.



Trouble Sending

This notepad window shows the basic structure of most of the Settings and Preferences pages. This page gives options available when Flash encounters a problem sending a file to a remote node.

Working with Flash

Operating under the less-memory-consumptive Flash "Light" (ouch!) configuration, Flash clearly trades speed for space-saving. This should not be a problem for most users, who will probably wait until they have finished whatever it is they are doing before looking at a transferred file anyway.

All in all, Flash is a helpful adjunct to any AppleTalk networking environment. At $199 per AppleTalk zone, however, Flash is priced at the high end of programs with similar functionality. It will most likely be used in networked environments that don't have TOPS or Timbuktu (since both programs permit chat and file transfers). Flash is, however, a useful product, and a good buy for smaller AppleTalk networks with a single zone or a small number of zones.—**Ed Tittel**

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String-Oriented Programming Languages

MAXSPITBOL 1.12D1

Pros: High-speed version of SNOBOL4; supports multiple windows. **Cons:** Text-only output. **Company:** Catspaw. **Requires:** Mac Plus. **List price:** $195.

PROICON 1.03

Pros: Creates stand-alone applications; incorporates new text processing and math functions. **Cons:** Text-only output. **Company:** Catspaw. **Requires:** Mac Plus; hard disk recommended. **List price:** $175.





For economic reasons, the first programming languages were oriented toward number crunching for engineering, science, or finance. By the early 1960s, computer scientists at Bell Labs decided to develop special programming facilities for text manipulation, and produced SNOBOL (StriNg-Oriented symBOlic Language).

Packed with features that simplify text and string processing, SNOBOL4 (the latest version) has proven admirable in its specialized domain, although most versions of it are fairly slow. This led to the development of SPITBOL (SPeedy ImplemenTation of snoBOL), a slightly restricted version of SNOBOL4 that's an order of magnitude faster. MaxSPITBOL brings this speed to the Macintosh—you can expect compiled programs to execute about 10,000 statements per second on a Mac II.

Although SNOBOL4 is rich in functions, structures, and ingenious concepts, its originators have continued to develop new programming ideas. The most promising have been incorporated into a new SNOBOL-like language called Icon, now available in a Mac version as ProIcon (the name was selected several years before the Mac made *icon* a household word).

Working with Text

To convey some of the flavor of Icon, here is a classic short program from *The Icon Programming Language,* (R. Griswold and M. Griswold, Prentice-Hall, 1983). The program reads a text file and produces a list of the words contained in the file, in alphabetical order.

```
procedure main( )
        letters := &lcase ++ &ucase
        words := set( )

        while line := read ( ) do
                        line    ?    while
tab(upto(letters)) do

insert(words, tab(many(letters)))
        every write(!sort(words))
        end
```

Note that the first little part of the program sets up a definition of letters and words to be applied to the input file, the next line starts reading, and the action of scanning the file is performed using the ? scanning operator.

The point is that you could hardly state the problem in fewer words than it takes to produce the Icon program—once you are minimally familiar with the keywords you can write useful programs in a matter of minutes.

The advantages of simplicity apply to both MaxSPITBOL and ProIcon, and the programming environments are similar, with multiple open windows, standard Macintosh editing, detailed online help, and large, well-written manuals full of infectious enthusiasm for the languages' possibilities. Designed for professionals, the manuals and the programs themselves pay exceptional attention to debugging issues. So which language do you pick?

MaxSPITBOL

If you want to process large files quickly, your best bet is MaxSPITBOL. The language is somewhat easier to learn than ProIcon, and a companion product from Catspaw ensures that after only a few days' familiarization you'll be able to do useful things. The disk contains all the functions developed in the 500-page text *Algorithms in SNOBOL4* (Catspaw, 1986), a set so complete that you will be hard put to define an application that can't be constructed from stringing together these canned solutions. Between this convenience and the program's raw speed, MaxSPITBOL is my choice for designing language translators or performing complicated pattern analysis of text files.

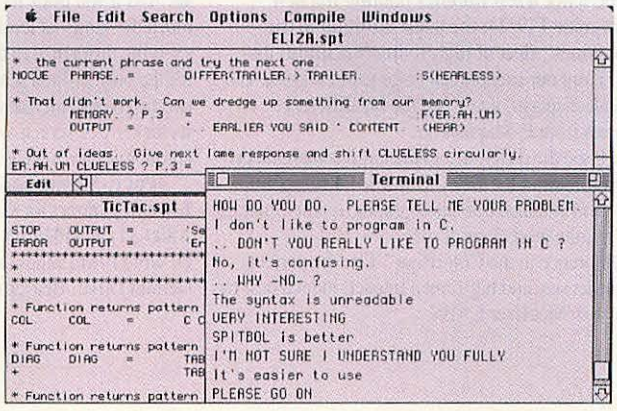
ProIcon

If you want to explore a uniquely powerful environment for producing stand-alone applications (specialized editors, symbol-manipulation programs, expert systems), the Icon language is the answer. Beyond the constructs of SNOBOL4, Icon provides goal-directed expression evaluation with generators, new higher-level string scanning operations, and the use of coexpressions. These capabilities take time to master, but ultimately contribute to the aim of having a language in which the definition of a problem becomes the set of statements that constitute the program code. ProIcon augments the basic language with math functions, functions for manipulating the Macintosh File System and interface (windows, dialog boxes, the Clipboard), and extended tracing and debugging.

Labors of Love

Both MaxSPITBOL and ProIcon represent a labor of love, and as a result

(continues)



Eliza
The window ELIZA.spt shows the MaxSPITBOL source code, while Terminal shows the output of a sample run with the program Eliza, a "psychiatrist" program, which was an early experiment in human-machine interaction.



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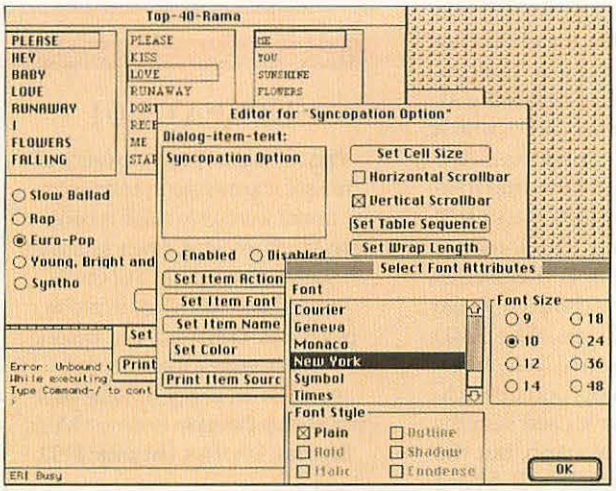
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Circle 101 on reader service card

both programs and their manuals give you much more than you could ordinarily expect for such a low price. As an additional benefit, customer support at Catspaw means contact with the people who actually developed the programs. Perhaps the Macintosh versions of SPITBOL and Icon, both serious improvements over their minicomputer versions, will finally take these languages from their mostly academic settings and get them out to a wider audience that can appreciate their unique merits.—**Charles Seiter**

See **Where to Buy** *or circle 779 (MacSPITBOL), 822 (Prolcon) on reader service card.*



The Interface Interface
The Allegro Interface Designer makes it easy to construct the front end for a program by dragging the appropriate controls into place.

Programming Language

MACINTOSH ALLEGRO COMMON LISP 1.3

Pros: Sophisticated interface builder; customizable editor environment; extensive debugger. **Cons:** Does not implement CLOS (but will in future); created applications are large; won't have virtual memory until System 7.0. **Company:** Apple Programmers and Developers Association. **Requires:** Mac Plus; 2MB RAM recommended. **List price:** $495.

Although LISP (the name comes from LISt Processing) has been around since the late 1950s, it has never been as popular as newcomers like C and Pascal. LISP has flourished in the artificial intelligence community, however, and wherever people need large and flexible data. Apple recently announced version 1.3 of the current standard, Macintosh Allegro Common Lisp (MACL), which should make users happy. MACL has an excellent debugger, and MACL makes it easy to link LISP code with Toolbox calls and dialog boxes to build LISP programs with very proper Macintosh user interfaces.

Although this situation is certain to change when Apple upgrades the Macintosh System software to include virtual memory, version 1.3 of MACL can access only 8 megabytes of storage space. MACL comes with 2600 Common Lisp functions that are already compiled, but fortunately they are not loaded from the disk until they are called. You can adjust the compiler to use various levels of error-checking, memory usage, and speed, and the compiler uses these settings to control the extent of optimizations such as, for example, constant folding, type checking, and inline expansion of functions.

Almost Object Oriented

Version 1.3 of Macintosh Allegro Common Lisp includes a set of object-oriented extensions called Object LISP, which is weakly classed and supports multiple inheritance and method combination. A future version of MACL will reportedly contain the complete standard Common Lisp object system (CLOS) embedded in the software. In the meantime, a similar object-oriented system, PCL, can be purchased separately from the Apple Programmers and Development Association.

The Interface

Version 1.3 offers programmers a productive working environment. In addition to the well-designed editor, MACL includes an object inspector and a good debugger. The center of MACL is the editor shell, appropriately named with the recursive acronym FRED (Fred resembles Emacs deliberately). This shell is used by the windows where programs are edited and in the Lisp Listener windows where the execution of programs takes place. The editor is easy to extend and customize because you can create new commands, and bind them to keys, with LISP itself. The editor automatically balances parentheses and displays the arguments of any function in a minibuffer at the base of the window. The editor makes programming a great deal easier.

The user interface also includes an excellent data inspector that displays the value of every function or variable in a separate window. Additionally, you can now use the inspector to look at the internal representation of any data object. These windows themselves contain objects that can be inspected recursively until you reach the base level of the data structure. The inspector window of a number, for instance, displays what type number it is (either integer, floating-point, or the boundless bignum) and also represents the number in either binary, octal, decimal, hexidecimal, or even Roman numerals.

The actual execution of a LISP program is easy to follow when you are using the debugger to follow the execution of your code. It displays variables and the MACL system stack whenever the program encounters an error or a breakpoint. The debugger window contains a great deal of information about the frame size and the program counter at this point. You can also walk through the execution of LISP expressions and watch the execution of each subpart of a function. You can find out just what the compiler is doing by disassembling the functions and reading the 68000 code.

Making a Macintosh Interface

The most impressive thing about the Macintosh version of Allegro Common

(continues)

Lisp is that it provides hooks that you can use to create a Macintosh-like interface for custom programs. The centerpiece of the MACL system is the Allegro Interface Designer (AID), which enables you to create windows easily. You can create new windows and then drag the correct controls into place using the mouse (see "The Interface Interface"). The controls themselves can be edited to have a complete range of fonts, colors, and sizes. When AID detects that a control has been pressed, it calls the appropriate background function. I have used systems like Prototyper and MacApp, but the AID system is the fastest way I have found yet to generate completely working systems.

If you aren't interested in using the prebuilt controls, or if you need to modify them a bit, you can make direct calls to the Macintosh Toolbox to build custom windows. The Toolbox routines are written in Pascal, and MACL has the necessary functions built in for easy translation between MACL and Pascal structures. You can also call any function built with the Macintosh Programmer's Workshop with MACL's Foreign Function interface.

LISP Stands Alone

After you've gone to the trouble of producing all of this work, you can create a stand-alone application that runs without the Common Lisp environment. This would be an ideal way to distribute finished programs if the application files were of manageable size. Unfortunately, the smallest ones are about 750K and the larger ones can be easily twice that. Because of this I would only consider using MACL for a stand-alone application if the background processing required LISP. Otherwise, I would build it with another system.

The programming environment of Macintosh Allegro Common Lisp is decidedly one of the best around. The debugger is excellent and the interface design system is superb. While it is true that LISP might not be the best thing for performing rapid computation or creating efficient programs, it is an ideal language for prototyping systems and experimenting.

—Peter Wayner

See **Where to Buy** *for contact information.*

Graphic Rhythm-Oriented Sequencer

UPBEAT 2.01

Pros: Fill feature permits creation of realistic improvisations; editing commands work while music is being played and recorded; device setups let you create templates that can be applied automatically as recording progresses. **Cons:** No tempo mapping within single patterns; timing resolution not as high as some MIDI sequencers. **Company:** Intelligent Music. **Requires:** Mac Plus. **List price:** $199.

Intelligent Music has always produced innovative MIDI software, and UpBeat 2.0, the latest version of the company's graphic, rhythm-oriented sequencing program, is no exception. What sets it apart from some of Intelligent Music's more esoteric releases, such as Jam Factory and OvalTune, is its degree of functionality for the working (as opposed to experimenting) musician. UpBeat's main purpose is obvious: to make rhythm programming easier than it is on conventional sequencers.

Why a Dedicated Program?

UpBeat brings the functional aspects of dedicated drum-machine programming to the Mac and takes it a step further by allowing you to operate nearly all of its editing functions while in record mode, so you can hear the effects of any operation without stopping the music. The basic idea is that you compose the music's rhythmic elements using UpBeat, then export the final performance in the universal MIDI file format and load that into a conventional sequencer program for any further keyboard overdubs.

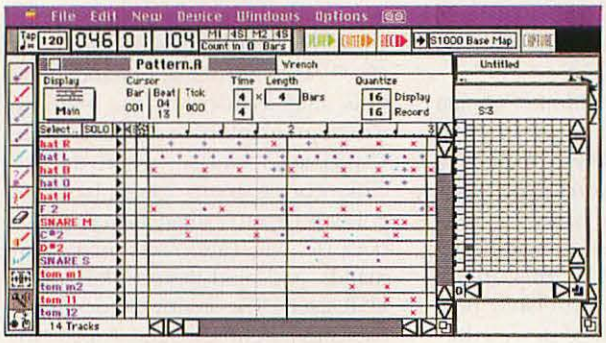
Getting the Beat Down

UpBeat lets you enter drum strikes into a pattern by playing on a MIDI instrument or by using the mouse. A pattern window's Strike view displays multiple tracks as rows of asterisk-like symbols that represent individual notes. The symbol's shape and color show the key velocity (which usually controls loudness) of each note, but unfortunately the choice of colors could be better, and they're not user-settable (as they are in Dr. T's Music Software's "M").

A pop-up selector enables you to quickly set the resolution of the timing grid that notes will snap to when played in via MIDI, and another pop-up selector controls the grid for notes painted in with the mouse. The highest resolution available is 192 divisions per quarter note—way shy of the 480 offered by some MIDI sequencers.

As you enter strikes via MIDI, each drum appears in a separate track, which is named automatically providing you have configured the Device List and the Instrument Setup. This rather elaborate but necessary procedure tells UpBeat what MIDI channel and note number or numbers you want associated with each user-definable sound name. An UpBeat sound—such as kick drum, snare, or low conga—would in most cases always trigger the same MIDI note, and therefore the same sound, on the receiving instrument; but the Instrument Setup window has a feature that allows you to enter a series of notes (and even chords) called steps that are associated with a given UpBeat sound. A display mode allows you to view and edit the step number assigned to each strike in a rhythm pattern. This lets a single track do things like trigger a

(continues)



Seeing the Pattern **Upbeat's main pattern window displays drum strikes as asterisks, with different shapes and colors representing the loudness of each strike.**

AW...WHAT THE HECK!

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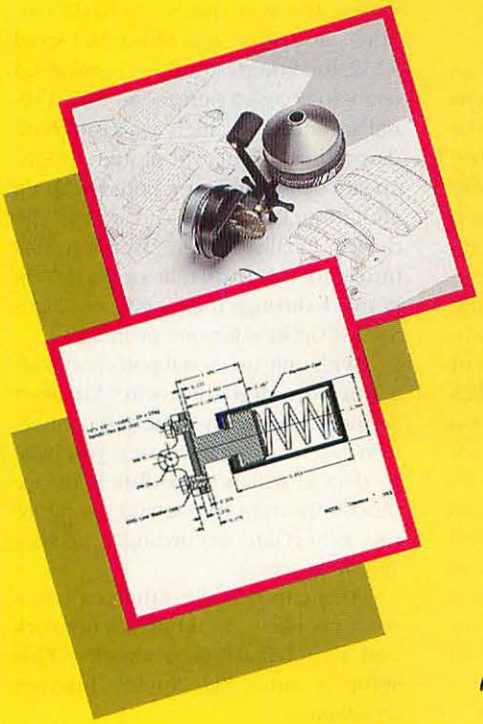
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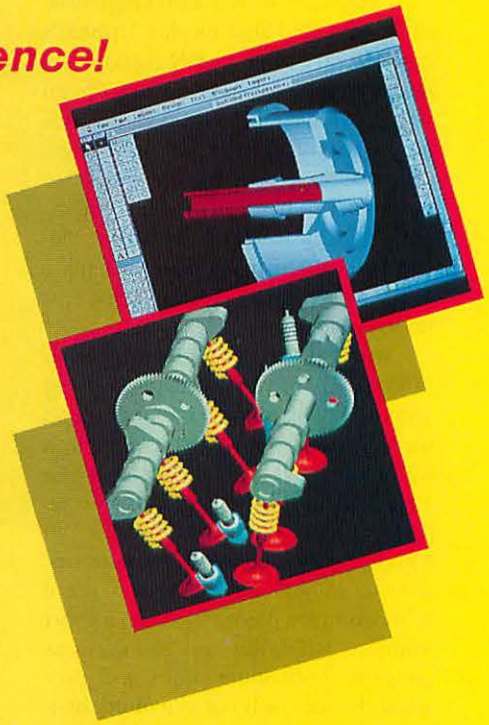
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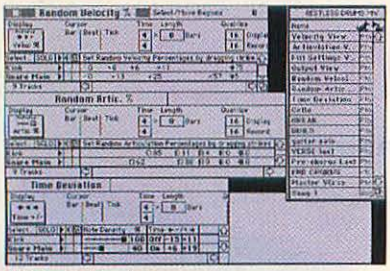
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UpBeat's Track Parameters

Here are three of the six modes for viewing pattern windows in UpBeat. By manipulating the parameters for each track in a pattern, you control how UpBeat selects random velocity, articulation, or time durations for each strike in a pattern.

number of similar-sounding high-hat samples by randomly choosing from that sound's steps.

Painting the Beat In

For mouse input, a floating tool palette lets you select from among five tools for entering strikes. The note velocity for each of the five types of strikes can be set individually for every track and every pattern, and you can set a range of random deviations for each of the five strike types as well. This lets you have gentle fluctuations in a track's dynamics without adjusting each note individually.

Combined with user-configurable ⌘, Option, and Shift modes, UpBeat's mouse-entry tools simply couldn't be better. Selected ranges of strikes can be cut, copied, and pasted with a variety of useful twists, such as Merge, Clipped, Swap, Fit, and Repeat Paste modes. And UpBeat enables you to copy and paste elements within Device Lists and Instrument Setups, making complex setup changes a lot easier to deal with.

With UpBeat you'll create a bunch of basic patterns—perhaps copying and modifying a few basic ones—and then create a song, which is actually a list of patterns that will play back one after another, with programmable repeats. A nice touch is that songs can contain other songs as well as patterns, so you can build a composition out of more complex pieces. You can import standard MIDI files and use them as patterns (containing notes and program changes only) or as a multichannel accompaniment track (containing all types of MIDI data as well as tempo changes) that plays alongside a song. Unfortunately, imported tempo maps can only be applied to songs, not to individual patterns, although each pattern has its own tempo setting, which can be used, ignored, or scaled during song playback.

The Very Heavy Part

UpBeat's most ingenious feature is its ability to manipulate the contents of each track according to precisely settable parameters; by adding drum strikes to the ones you've entered, the program can actually improvise fills and riffs.

Another great feature is UpBeat's compatibility with Apple's MIDI Manager. This System-level MIDI driver allows multiple programs running under MultiFinder to exchange data in real time. It also lets you run multiple sequencing programs in sync, with applications in the background continuing to play or record. If you've got the RAM and the CPU power to run UpBeat and a conventional sequencing program simultaneously, this is just about as good as having two Macintoshes. You can basically use UpBeat as an extension of your sequencer, with some or all of the rhythmic elements being played by UpBeat, and data like keyboard parts and MIDI controller information being played by your sequencer.

For Whom, and Why?

UpBeat is perfect for anyone who has a hard time creating elaborate rhythms on conventional sequencers, since the editing tools let you work much faster; and getting to hear your music continually while you work helps you keep in the groove. The capabilities for creating subtle variations quickly and easily make the program a must for the serious professional MIDI drum programmer. It won't necessarily cut down on the amount of time it takes to complete a drum track, but you can have a much more expressive track in the same amount of time. Both drummers into MIDI percussion and keyboardists trying to simulate the real thing will find UpBeat an indispensable tool if they invest the time to get a handle on the important controls. Besides that, it's a complete blast to use.—**Charles Clouser**

See **Where to Buy** *or circle 870 on reader service card.*

Network Router

ETHERGATE 1.45

Pros: Versatile; supports both AppleTalk Phase 1 and Phase 2 networks; easy to set up; Internet Manager software provides centralized administration of all devices. **Cons:** Does not support AppleTalk-to-TCP/IP packet translations. **Company:** Shiva Corporation. **Requires:** LocalTalk and EtherTalk. **List price:** Version 1.46 $2399.



The new EtherGate packs as much power and versatility as most of Shiva's products. It lets workers on a network share plotters and modems, and continue using their favorite peripherals even though they're using an Ethernet network.

Four in One

The EtherGate is built to handle four different network functions—but not simultaneously, since it has only three active connections. How you mix and match the connections is determined by the Internet Manager setup software.

The EtherGate can route AppleTalk packets between LocalTalk and EtherTalk networks; it can also route packets between two LocalTalk networks, the way the Shiva NetBridge does. And, like the Shiva NetSerial X232, the EtherGate allows networked users to access a peripheral with a serial connection, such as a modem, daisy wheel printer, or plotter. In EtherGate's case, however, both LocalTalk and EtherTalk users can access the device. Finally, remote users can dial into either a LocalTalk or EtherTalk network through the EtherGate. That's a lot of options for one product.

With only two serial ports and both a thin-wire and thick-wire Ethernet connector (only one Ethernet connection can be used at a time), you have to decide which three functions are most important to you and configure the EtherGate accordingly (a very simple process).

You can use the EtherGate as a router between an EtherTalk network and two LocalTalk networks. This setup is much like Apple's Internet

(continues)

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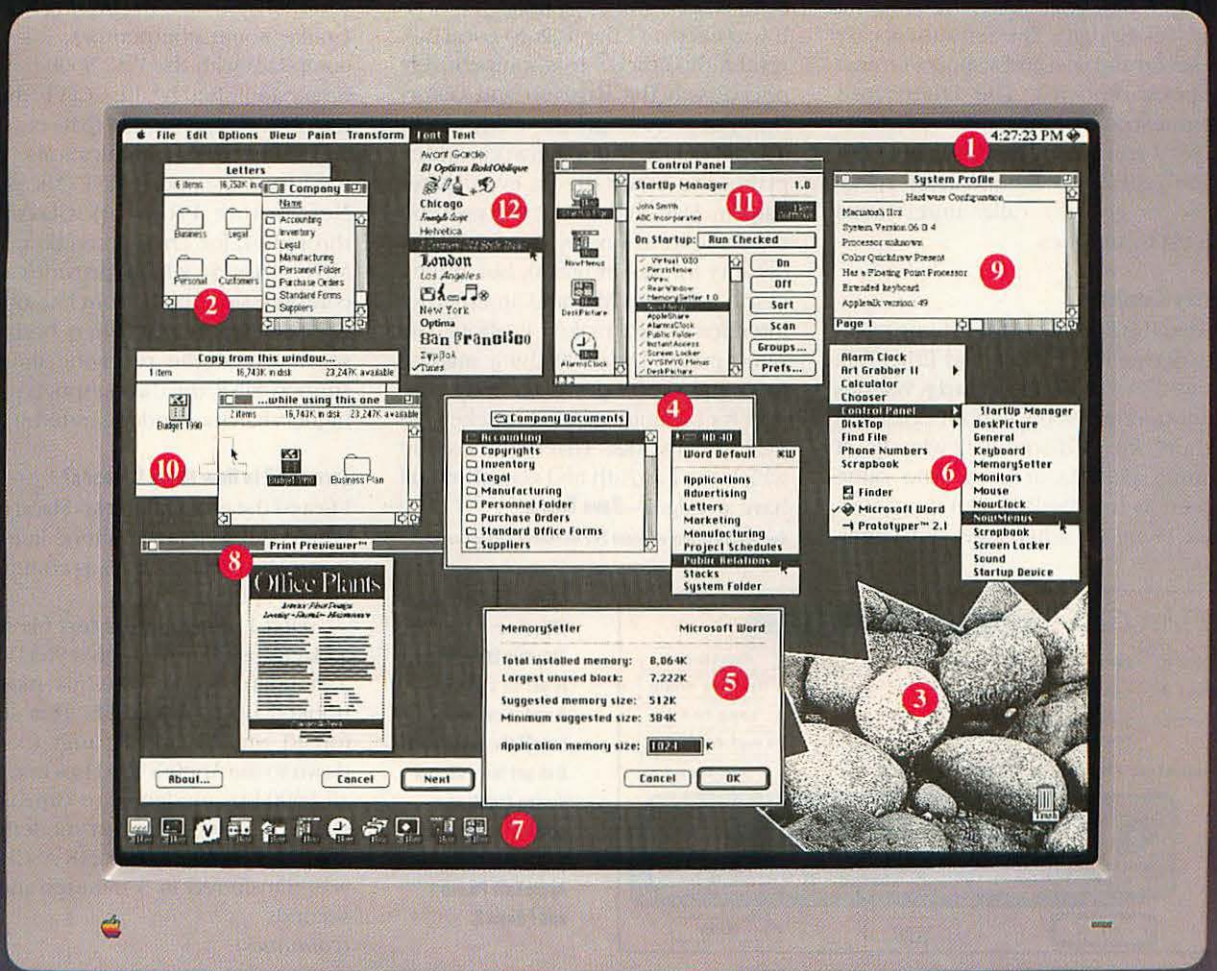
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Router or Infosphere's Liaison on a Mac, but it has the advantage of not requiring a dedicated Mac for the routing. (Neither do the Kinetics FastPath or the Cayman Systems GatorBox, but they only handle one Ethernet and one LocalTalk network.)

You can also use the EtherGate to provide networked users on EtherTalk and LocalTalk with access to a shared peripheral, such as a high-speed modem or plotter. Shiva's popular NetSerial X232 performs a similar function, but it's limited to LocalTalk networks only. With the move toward faster networks like Ethernet, the EtherGate allows you to provide the same shared peripherals as before, but to EtherTalk and LocalTalk users alike, with the same interface.

If you use the EtherGate to provide network access to a modem, then you can also use it to support dial-in access to the EtherTalk and LocalTalk networks. Remote users use the same Dial-In Access software that Shiva provides with its other products (NetBridge, NetSerial X232, NetModem, and TeleBridge). The software is easy to set up and use, and it supports most popular modems. The EtherGate's administrator can either restrict a caller's access to a particular network zone (either on EtherTalk or LocalTalk) or give the caller unrestricted access to all zones.

Setup Simplicity

I tried the EtherGate for routing packets between LocalTalk and EtherTalk as well as for sharing a Hayes V-series Smartmodem 9600. In both cases, the EtherGate performed flawlessly. It routed packets at about the same speed as the FastPath and the GatorBox. Using the EtherGate's serial-emulation driver to access the modem worked fine with VersaTerm, AppleLink 5.1, and Desktop Express. Remote access to the network worked with AppleShare 2.0.1, TOPS 3.0, QuickMail 2.2, and Microsoft Mail 2.0.

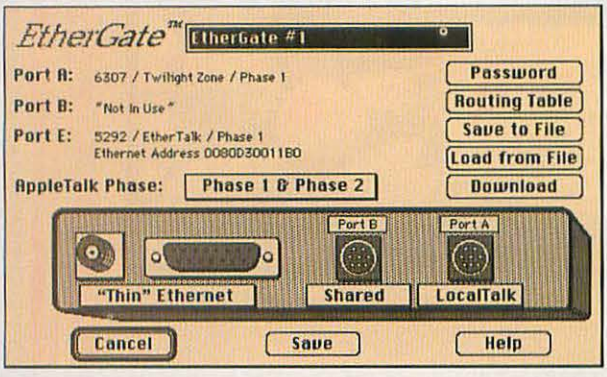
Because Shiva has now centralized all configuration and control of its entire product line into Internet Manager, not only can you configure one or more EtherGates but you can set up other Shiva products such as the TeleBridge, NetBridge, and NetModem as well.

With the EtherGate, your main concern is what functions to assign to the two serial ports, which can be selected as either LocalTalk ports for network routing or for connecting other devices (see "Main Configuration Window"). To set up the ports, you need only point and click your way through a series of options, most of which are self-evident. If there's any question, the manual does a pretty good job of explaining.

Better than the Swiss Army Knife?

If you need an EtherTalk-to-LocalTalk router, the EtherGate is competitively priced with the FastPath and GatorBox. But you also get the ability to add a serial device to the network, which makes the EtherGate an even better bargain. Liaison on a Mac can give you the same functionality (plus call-back security for dial-in users), but adding in the price of a Mac and an Ethernet interface board makes it about the same price. The only thing missing from the EtherGate is gateway support for putting AppleTalk packets on TCP/IP networks. That's one area in which the FastPath and GatorBox still have an edge.—**Dave Kosiur**

See **Where to Buy** *or circle 742 on reader service card.*



Main Configuration Window
The thin Ethernet port is set on serial port A and is set up for LocalTalk; serial port B is set for a shared device (such as a printer). It is also set to translate between AppleTalk Phase 1 and Phase 2.

9600-bps V.32 Modem

RACAL-VADIC 9632VP

Pros: Flawless performance; full V.32 compliance; MNP error-control Classes 2–4; MNP data-compression Class 5; Hayes AT compatible; modem settings controlled by software or manually; attractive styling. **Cons:** No software included; lacks driver for popular communications software; ugly power supply. **Company:** Racal-Vadic. **Requires:** Mac 128K; serial cable. **List price:** $1195.

If you do file transfers by modem, you can cut your phone bills dramatically with a high-speed modem. But there are two catches: not all fast modems comply with international standards, and you need the same speed capability on both ends of the transmission to achieve that throughput.

Provided you can make use of 9600-bps power, Racal-Vadic's 9632VP external modem is a tempting option. Unlike some competitors, it's fully compliant with the V.32 9600-bps criteria established by the CCITT, the international organization that sets standards for telecommunications. This modem also supports MNP (Microcom Networking Protocol) Classes 2 through 4, for error correction, plus MNP Class 5, which provides data compression. The bottom line on the compression is that when both the sending and the receiving modem support MNP, the throughput is much higher than the modems' rated speed.

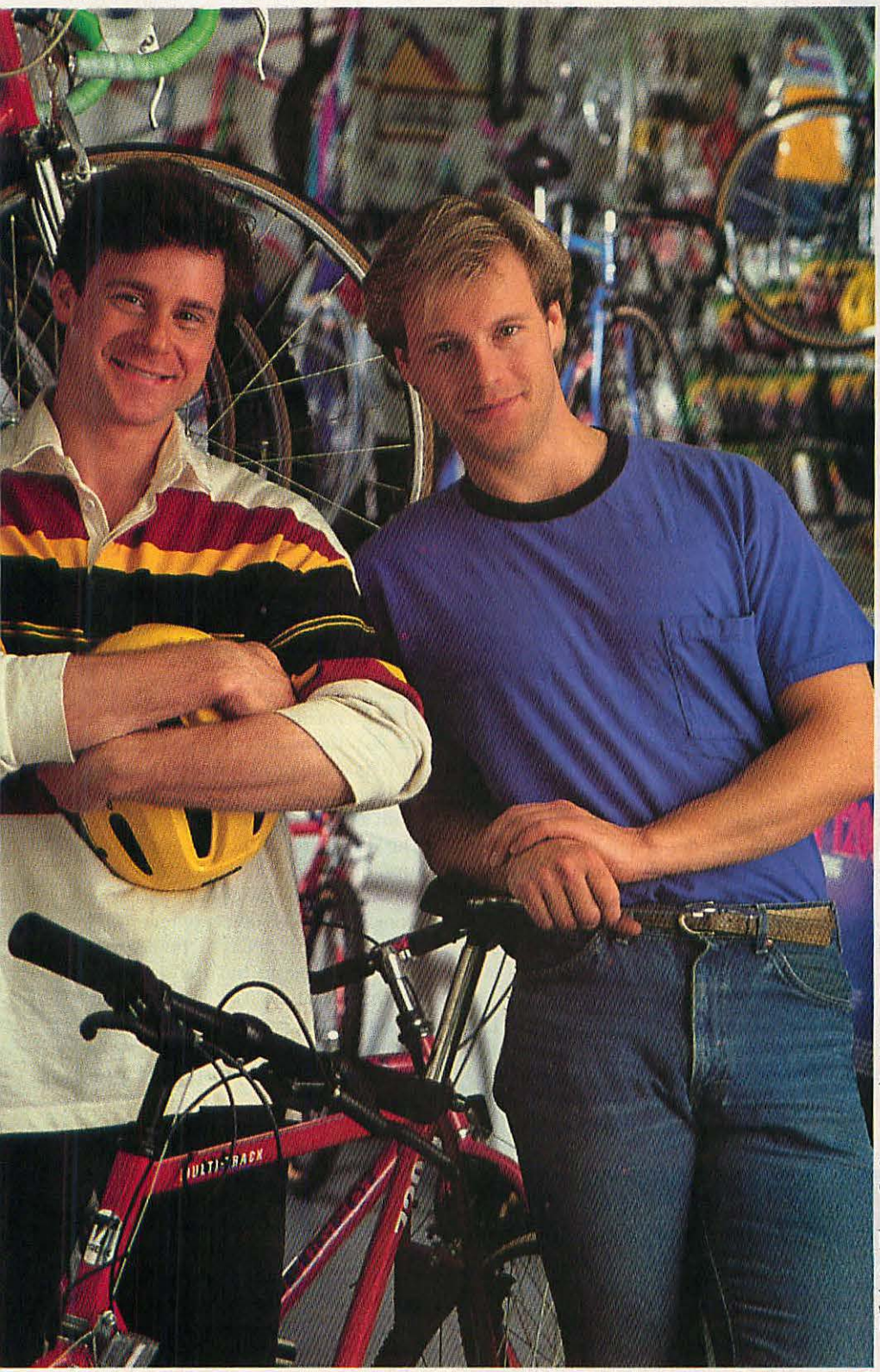
Zero to 60 in How Many Seconds?

I tested the modem on two Macs, each connected to its own phone line and using MicroPhone II 3.0 as communications software.

First I transmitted a text file from a Macintosh IIcx through a 9632VP to a standard Apple 1200-bps modem hooked up to a Mac SE. This setup forced the Racal-Vadic unit to step down to the Apple's 1200-bps rate. Not all 9600-bps modems are capable of stepping down. The test modem responded perfectly. The 24K ASCII file was transferred in 3 minutes and 24 seconds.

(continues)

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MARK JOHANN

The Racal-Vadic 9632VP

Next I tried a humongous PixelPaint Professional 24-bit color graphics file. I transferred this 516K file with the fast Zmodem protocol in MacBinary II file mode, to preserve all of the Macintosh characteristics of the file, including the icon. It's slower to transmit intricate graphics files than straight ASCII characters. The process took a dreary 1 hour and 15 minutes. The throughput was excellent, considering the limitations of the Apple modem.

I replaced the Apple 1200-bps modem with a second 9632VP modem and retransmitted the same two files. The ASCII file now transferred in 16 seconds flat, and sending the graphics file (a tougher job, remember) was completed in 6 minutes, 56 seconds.

The news gets even better. MicroPhone II has no specific driver as yet to maximize the performance of this particular brand and model of modem; still, I make these transfers simply by selecting the standard driver.

I also used these 9600-bps modems to connect to MCI Mail and CompuServe. The modems stepped down to these services' 2400-bps in speed nimbly and logged on without a hitch.

Looks Good in the Showroom, Too

The 9632VP, which sits only 1½ inches high and has a rakishly slanted front end, displays five little indicator lights that continually report on the status of transfers. In addition, there are five push buttons that let you control many operations by hand, without the help of communications software. The first button, called Data, can be used to switch your telephone between data and voice operation, disconnect the data link when the modem is online, redial the last number dialed, or help you set up to answer a call in data mode.

Pushing the Speed button repeatedly changes data-transfer rates from 9600 to 4800, 2400, 1200, or 300 bps. Different colored lights tell you which mode you're in.

Pressing the Answer button turns automatic call answering on and off, and the Sync button toggles between synchronous and asynchronous operation. The final button, Loop, runs the modem's built-in tests. The 9632VP's speaker has excellent fidelity, with an easy-to-reach volume control. The modem has no on/off switch, but you can easily disconnect using the front buttons.

In addition to support for the extended Hayes AT command set, Racal-Vadic includes an advanced language of its own. It's more friendly than the Hayes language, and you can use it to communicate with built-in functions. For example, you can store up to 15 phone numbers in the modem's own memory.

The Racal-Vadic has no DIP switches. There are a few settings that must be changed using internal jumpers, for example, one of the settings that configures the unit for leased-line operation. The advantage of this design is that if power is temporarily lost, you do not have to reissue linking commands; the modem automatically reestablishes the connection when power is restored.

Although it doesn't come bundled with communications software, the Racal-Vadic 9632VP gives you the best of both the 2400- and 9600-bps worlds. It's a modem that you can use with just about any hardware or software.

—Marvin Bryan

See **Where to Buy** *or circle 830 on reader service card.*

TRANSFER RATES

File Size	Time (in seconds)	Effective Transfer Rate (in bps)	Actual Transfer Rate (in bps)	Conditions
24K	204	963	1204	1200 bps, no MNP5 compression
24K	16	12,288	15,360	9600 bps with MNP5 compression
516K	4500	939	1174	1200 bps, no MNP5 compression
516K	416	10,161	12,701	9600 bps with MNP5 compression

The effective transfer rate takes into account only the size of the file as stored on the Mac (8 bits per byte) and the time required to transfer the file. The actual transfer rate includes the added data required by the modem to control the data transfer: 2 stop bits per byte, or a total of 10 bits per byte.

Visual Programming Language

PROGRAPH 1.2

Pros: Nicely designed interface; well-integrated object-oriented debugger. **Cons:** Low density of information on the screen; no compiler yet. **Company:** TGS Systems. **Requires:** 1MB RAM; hard disk recommended. **List price:** $195.

TGS Systems has taken the maxim "a picture is worth a thousand words" to heart with its visual programming language Prograph. The system represents a program as a set of icons joined by lines. The data starts at the top of the picture, flows along the lines, and then gets changed by the operations of the icons. Prograph is object-oriented and contains many different hooks that make it simple to build an interface for the Macintosh. The language aims not only to be easy to use, but also to be a major refinement of programming technology for sophisticated programmers.

Prograph is quite different from languages like C or Pascal. The major difference is that data is not handled by using variable names to refer to storage locations. Instead, the language follows the paradigm of object-oriented programming; the data is bound up in *objects*, which contain not only information but also the programming routines that manipulate the object. For instance, each object might contain a routine for drawing itself on screen. A number object would contain a piece of memory and the neces-

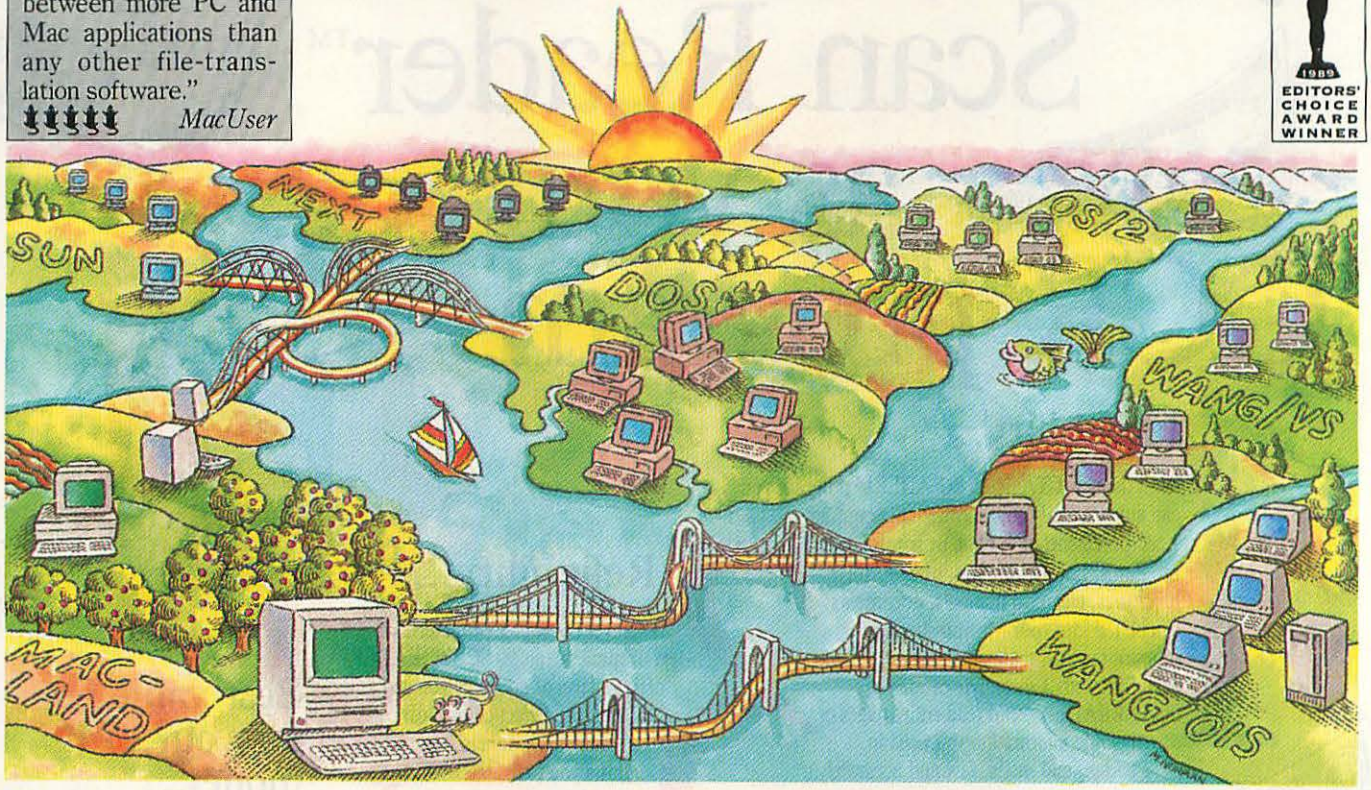
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MacLinkPlus/Wang OIS and MacLinkPlus/Wang VS provide the same bi-directional connectivity between Macintosh and Wang.

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If you don't need file transfer capabilities (maybe your Macs and PCs already share a network or server), then simply order MacLinkPlus/Translators. It's the same package without the cable and communications capabilities. And, it's the ideal software purchase for anyone with a Macintosh FDHD SuperDrive or external drive that reads DOS disks.

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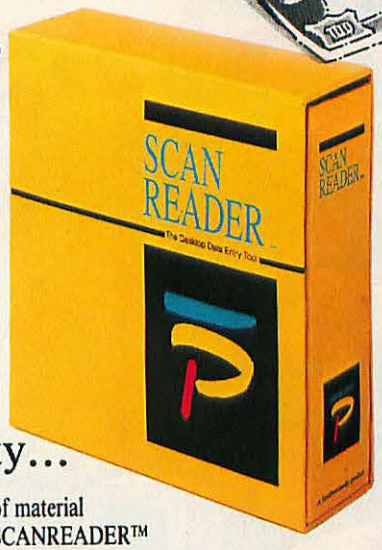
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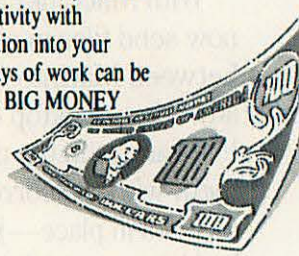
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Programs for the future

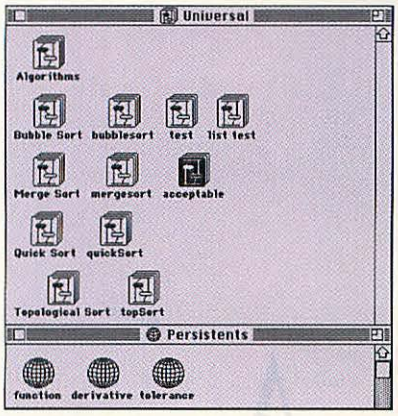
Circle 400 on reader service card

sary routines for converting binary representations to arabic numerals and drawing these characters on the screen. This object-oriented approach is not much different from that of the newer languages like C++ and Object Pascal, which have much of the same structure.

Dataflow Programming

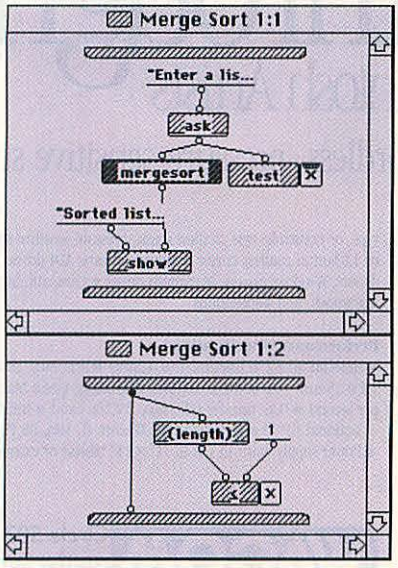
Object orientation, though, is not the only thing Prograph offers; its programs are also described on screen in a visual language modeled after many of academia's dataflow languages. A traditional programming language demands that the programmer describe the program in terms of actual physical locations. Dataflow languages, in contrast, require the programmer to describe the paths the data will take between operations. The computer is responsible for handling the physical locations where the data is stored. This way, data paths can be represented with lines.

The visual approach can also make designing parts of an optimizing compiler easier. TGS Systems is promising a compiler with the next major release. In the meantime, people who want to run Prograph programs will have to make do with a run-time interpreter.



Screen-us+persi

The two windows here show the Universal methods, which are equivalent to global procedures, and the Persistents, which are data objects stored on a disk like files.



Screen-merge-sort

This figure shows part of a Prograph program for sorting a list. The data flows from the bar at the top of the windows down through the icons, which may be primitive operations or subroutines.

Writing No Wrongs

A programmer who sits down to create with Prograph must first visualize all steps of the program. The entire interface is a collection of icons and windows. There are over 16 different icons that can be strung together in a program window. Some icons specify constants, while others represent different types of primitives. Some features—for example, the show functions, which display an object in a window—will seem familiar to programmers; others, like the list primitives, will seem different even to LISP programmers.

Only a few of the windows that pop up on the screen actually hold programs. The programmer organizes the classes and their methods and attributes in other windows. The stack window used in debugging contains a line of icons representing the different methods waiting to be finished.

Visual Debugging

Debugging is also a visual procedure in Prograph. Not only are the stack and the intermediate state of the program displayed in a picture, but Prograph also animates the screen as the program runs so that you can follow the flow of the data through the maze of icons. You can selectively set the different methods in the system to either animate or single-step through their routines. Clicking in the right place reveals the values of the data at different points. The system is as useful as the best debuggers made by Symantec.

The program's best advantage, though, is for people developing programs that use the Macintosh interface. This is not a consequence of the icons, but of the object-oriented structure. Prograph comes with predefined objects for the full assortment of Macintosh controls. These can be threaded together with the right icons to make an application very quickly. The input and output routines for Prograph are designed to pull things directly from input and output fields in a window. The program's functionality is quite similar to MacApp, which is a standard textual language that runs under the Macintosh Programmer's Workshop.

Overall Impressions

Prograph certainly will not make every Macintosh user a programmer. Arranging instructions for a computer requires that you think logically and precisely. People who enjoy programming, though, will find Prograph intriguing. Not just because it is visual, but also because it is both an object-oriented language and a dataflow language. The combination of the three is rare and Prograph has knitted them together very harmoniously.

—Peter Wayner

See **Where to Buy** *or circle 821 on reader service card.*

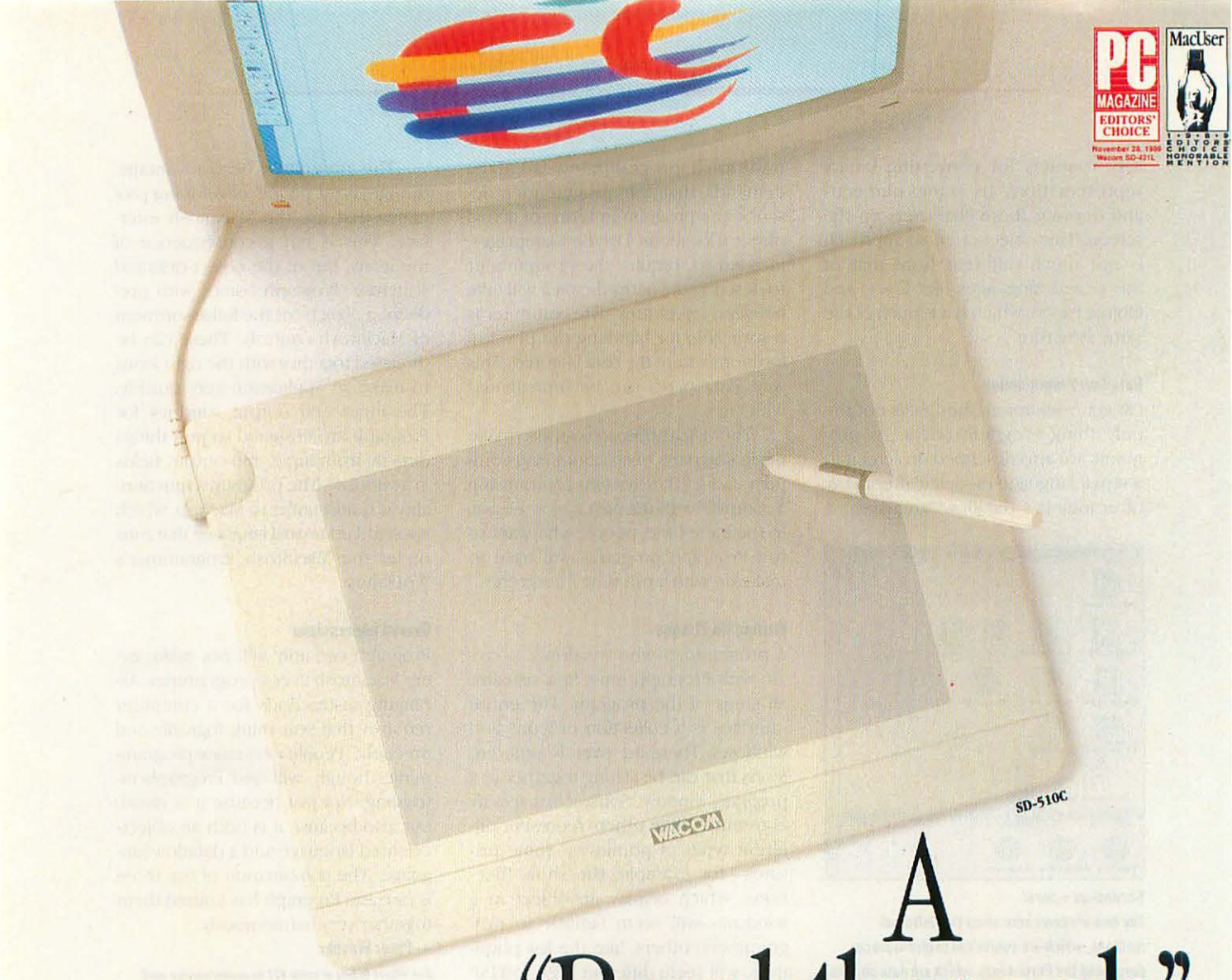
PostScript Conversion Utility

METAMORPHOSIS 1.0

Pros: Accurately converts to any combination of the available formats; permits conversion of multiple fonts in a single session. **Cons:** Rare lapses in character fill. **Company:** Altsys Corporation. **Requires:** Mac Plus; PostScript printer with Adobe-licensed PostScript interpreter. **List price:** $295.

By converting PostScript printer fonts to character outlines that you can edit, Altsys's Metamorphosis adds an important tool to the desktop publisher's utility tool chest. For anyone who manipulates type with Adobe Illustrator, Aldus FreeHand, Altsys's Fontographer, or Brøderbund's TypeStyler, Metamorphosis is a must-buy item.

(continues)



PC MAGAZINE EDITORS' CHOICE November 28, 1989 Wacom SD-421L

MacUser 1989 EDITORS' CHOICE HONORABLE MENTION

A "Breakthrough" Graphic Tool for Macintosh Artists

The Wacom cordless, pressure-sensitive stylus.

The Mac has always had great potential in graphic arts. But until now, no one has really provided a tool to unleash it. There has always been some form of mechanical trade-off imposed by input devices that inhibited artists from letting their imaginations flow naturally.

Now, Wacom introduces a totally "real" graphic tool, one that let's you interact with the Mac as intuitively as you would with a canvas. With Wacom's cordless, pressure-sensitive stylus your will is converted through manual pressure to line width, spray density, color change and other programmable effects. This allows you to create "real time" artistic images free of the artificiality and limitations of other input devices. And since the Wacom stylus has neither cable nor battery, it is also ultra-light and maintenance free.

Wacom, a leading name in computer graphics worldwide with proven man-machine interface technology, invites you to a new era in Macintosh graphics with a promise:

Once you experience it, you'll never look back.

Wacom SD-Series Digitizers:
● A0 to A5, square or rectangular ● Surface types: standard, magnetic, electrostatic, or transparent menu panel ● Pointing devices: Stroke-type, or nonstroke-type cordless stylus, pressure sensitive stylus, 4-button or 12-button cordless cursor ● Driver software: ADI driver, mounse drivers, Windows drivers, Macintosh driver ● Compatibility: PCs, Macintosh, and workstations.

Performance/Specifications
● Resolution: 1,270 lines/inch (0.02mm) ● Accuracy: ±0.01 inch (±0.25mm) over entire active area ● Reading speed: Max. 205 points per second ● Data transfer rate: Max. 19,200 baud ● Interface: RS-232C or optional GP-IB ● Command set: Wacom II, MM, Bit Pad Two ● Power supply: built-in (A2 to 11″×11″ tables) or external (A0, A1, A5).

WACOM **Circle 507 on reader service card**

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Tel: (1) 201-265-4226, Fax: (1) 201-265-4722
WACOM Computer Systems GmbH:
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B is for Bezier
In this screen, Illustrator 88 has opened an EPS file of Helvetica character outlines generated by Metamorphosis. The *b* is selected for bezier curve editing.

Startling Transformations

Metamorphosis can transform any PostScript font in several distinct ways. For starters, the program converts Adobe Type 1 fonts directly into Fontographer Type 3 fonts with the accompanying AFM font metrics files. Even better, Metamorphosis can convert any printer font into an Illustrator EPS file containing the outlines of all the font characters. You can move individual characters to an Illustrator or FreeHand newsletter or flyer, and then shape, color, and otherwise embellish the letters to suit the project.

Another option is to have Metamorphosis save font information in Fontographer format; then you use Fontographer to edit the character shapes. Once you're satisified with the results, Fontographer generates a new PostScript font and makes it available to all your applications that use text. With Metamorphosis and Fontographer, you can also convert fonts downloaded to your printer from another computer—a PC, for example—into Mac fonts, complete with screen bitmaps. Finally, in concert with Fontographer 3.1, Metamorphosis can improve the quality of existing Type 3 fonts. If all you have is the font itself, not the Fontographer file from which the font was generated, Metamorphosis lets you take the font back into Fontographer where you can regenerate the characters as a Type 1 font.

Direct to Printer

No matter which of these conversions you choose, Metamorphosis works by tapping a printer's PostScript interpreter directly—that's why the program requires a true Adobe PostScript printer. You can work with fonts stored on the Mac's hard disk, on the printer's hard disk, or in the printer itself (if the font resides on the Mac, Metamorphosis downloads the font first). After contacting the printer, Metamorphosis requests the font's character outlines, transforms them into whatever combination of formats you've specified (Type 3, EPS, or Fontographer), and saves the resulting files on disk.

Batch Conversions

Metamorphosis offers only a handful of options. All you do is choose the fonts you want to convert—you can convert a whole batch in a single session—and the formats in which you want to save them. After that, you just sit back and wait for Metamorphosis and the printer to complete the conversion. Because the PostScript interpreter does much of the work, the time required depends almost as much on the printer's processing speed as on the Mac's. No matter how powerful the hardware is, though, you'll spend at least a couple of minutes drumming your fingers.

But the results are worth the wait. Aside from a slight increase in the jaggies in converted Type 1 fonts, the new characters faithfully replicate the originals, whether you print them from within an illustration program or as ordinary text. Occasionally a character converted from a Type 3 font shows incorrect filling, so that areas where the character outline overlaps itself print white instead of black (you can fix this problem in Fontographer). In addition, Metamorphosis doesn't work well with fonts, such as Courier, that are composed of stroked lines rather than outlined shapes; fortunately, such fonts are unusual.

Painless Customization

Unlike the originals, the converted characters can be shaped and shaded to your liking in Illustrator or FreeHand. If you do any work with display type in either program you should consider Metamorphosis as an indispensable desktop publishing tool. And if you're an electronic typographer, how can you possibly resist a product that lets you painlessly customize any existing PostScript font? Instead of laboriously creating your own font from scratch, you can start with a complete character set from any font you admire. Once Metamorphosis has converted it to Fontographer format, you can tweak a few character outlines, alter kerning, or add missing characters. Voilà—your own special font. You can even combine characters from several fonts to create, say, your own dingbat font.

A Tip

If you already own PostScript fonts formatted for the IBM PC or another type of computer, Metamorphosis provides the means to use them in Macintosh applications as well. Unfortunately, Altsys's overly brief manual (only 36 pages long) fails to mention this capability and omits the necessary technique. Here it is. After downloading the font, switch the printer to Macintosh mode. Next, use Apple's LaserWriter Font Utility to obtain the official name of the font as represented in your printer (capitalization counts). In Fontographer, open a new empty font file, saving it with it exactly the same name as the printer font, then generate a screen-font file for the dummy font. Switching to Metamorphosis, open the dummy screen font and start the conversion. Yes, the process is involved, but it worked perfectly in my tests.

If you do use Fontographer, you will wish that Altsys had simply incorporated Metamorphosis's features directly into Fontographer—that would make the process of font conversion and editing much more convenient. Otherwise, though, Metamorphosis cannot be faulted. If you are a Mac desktop publisher with any interest in type, Metamorphosis belongs in your software library.—**Steve Cummings**

See **Where to Buy** *or circle 782 on reader service card.*

Communications Packages for Wizard

PALMTOP LINK FOR THE MACINTOSH 1.0

Pros: Miniapplications are easy to use; clear instructions for transferring data to or from other applications. **Cons:** HyperCard button installer doesn't work as advertised; no phone dialer; does not support 64K RAM board for the Wizard. **Company:** Traveling Software. **Requires:** Mac 512K. **List price:** $149.95.

ORGANIZER LINK 1.1

Pros: Well-designed hardware interface; software can be customized using HyperTalk. **Cons:** HyperCard-based user interface deviates from Mac standards; limited capability to communicate with other applications; no phone dialer. **Company:** Sharp Electronics Corporation. **Requires:** Mac Plus. **List price:** $109.99.



Since its earliest days, the Macintosh has inspired software developers to produce on-screen personal-information organizers. Dozens of packages are available to make it easy to organize phone numbers and addresses, keep track of appointments, and file various kinds of notes and memos (See "Roll Over Rolodex," *Macworld*, May 1990). Some of these software secretaries are desk accessories; others are stand-alone applications; still others are HyperCard stacks. But whatever form they take, all of these programs share one inherent limitation: they're of little help if you aren't within reach of your Mac. If you need to record engagements, expenses, and contacts away from the office, you're forced to use pencil and paper or a portable computer.

The Wizard, Sharp's electronic organizer, is an ultraportable computer with built-in software for recording appointments, addresses, and memos. This pocket-size wonder can be outfitted with additional cards for recording expenses and other data so that it can compete function-for-function with many of the best of the Macintosh personal organizers. What's missing in this tiny package is the kind of friendly user interface that Mac users expect. The LCD display is easy to read but tiny, so that information has to be displayed in small pieces. And the alphabetically arranged keyboard, while adequate for quick calculations, is a touch-typist's nightmare for serious note-taking.



MARK JOHANN

Sharp's Wizard, an electronic organizer

Hardware Links

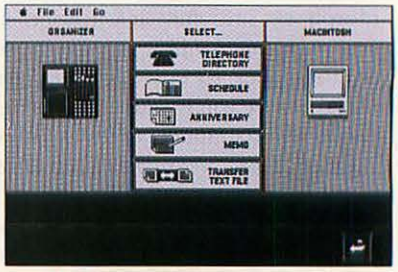
In an attempt to provide users with the convenience of the Wizard and the friendliness of the Macintosh, two companies have developed packages designed to allow the two machines to talk to each other. Using either of these packages you can store personal information on the Mac when you're in the office, carry the data with you and modify it on the Wizard when you travel, and bring new information home to the Mac at journey's end.

Both Sharp's Organizer Link and Traveling Software's Palmtop Link include hardware, software, and documentation. The hardware in each case consists of a cable that connects the Macintosh modem port to the Wizard's serial port. The more complex cable system in the Palmtop Link is designed to accommodate both the current Mac line and the Mac 512K and 512KE. But the Palmtop Link cable is not as solidly constructed as the Sharp cable, and the software can be confusing unless you refer to the manual.

Connecting the two computers with either cable is easy, but the Wizard's tiny hatch cover is easy to lose. And there's another hazard to be aware of: when the two machines are connected and the Wizard is in PC Link mode, the Wizard's tiny batteries are powering the Mac's serial port. This can result in a serious battery drain.

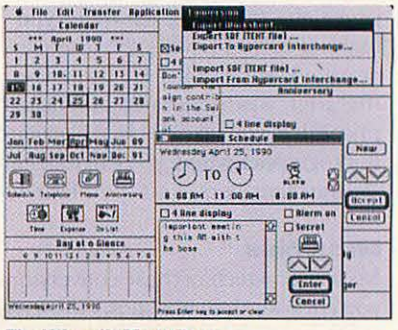
The software included with each package is designed to provide easy transmission of information between the Wizard and the Mac, to enable you to easily enter and edit Wizard-compatible data on the Macintosh side of the bridge, and to facilitate the trans-

(continues)



Focal Point Jr.

The menu screen for Organizer Link allows you to choose between several different Wizard-like modules.



The Wizard's Many Faces

Palmtop Link enables you to work with several different miniapplications that mimic the Sharp Wizard's basic functions.



If You Can Find A Better Deal In Hard Drives . . .

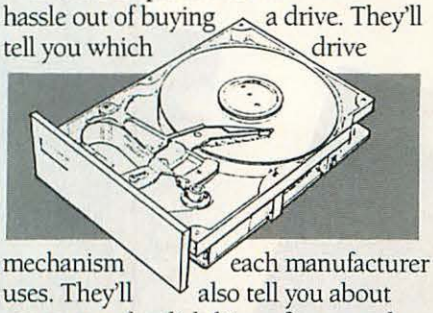
Between now and July 31 st, MacWarehouse is offering savings on every hard drive we sell. So, if you're thinking of buying a new hard drive, your timing couldn't be better. Check out our sale prices and your savings, compared to our December 1989 prices, in the chart.

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	SALE PRICE	YOU SAVE	SALE PRICE	YOU SAVE	SALE PRICE	YOU SAVE	SALE PRICE	YOU SAVE	SALE PRICE	YOU SAVE	SALE PRICE	YOU SAVE
Cutting Edge	339	$100	379	$120	435	$114	469	$160	529	$210	699	$200
CMS, MacStack	429	$100	499	$46	589	$36	649	$50	769	$30	839	$36
Power User	319	NEW	359	NEW	399	NEW	459	NEW	499	NEW	659	NEW
PLI, Infinity Turbo	–	–	569	$20	619	** $26	–	–	–	–	999	$120
*Quantum Internal	–	–	–	–	399	$126	–	–	649	$220	–	–

Savings are calculated from MacWarehouse December 1989 published prices. *Quantum drives are for internal installation and require a 3.5 Internal Drive Kit for $75 **PLI is a 50meg turbo drive. ***40+ meg Removable Cartridge Drives come with 1 cartridge. Additional cartridges available.

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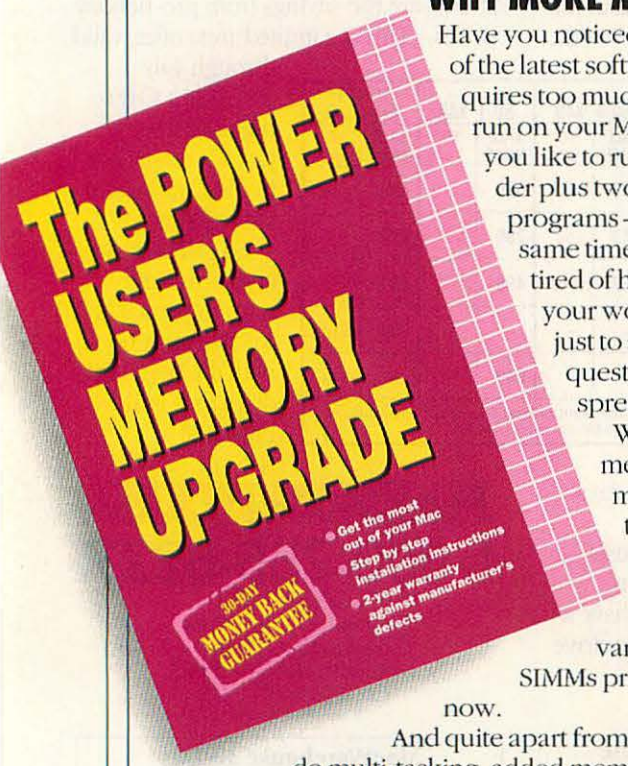
The next best thing to a new Mac is a MacWarehouse Memory Upgrade!

1MB SIMMs Modules... *Now only $85 each.**

Now you can unlock the awesome power in your Mac and use it to it's full potential with a Memory Upgrade from MacWarehouse. By replacing the existing 256K memory chips with our powerful 1MB memory modules you can bring more brain power to your Mac than you thought possible.

And a memory upgrade is easy to install yourself, in not much more than half an hour.

WHY MORE MEMORY?



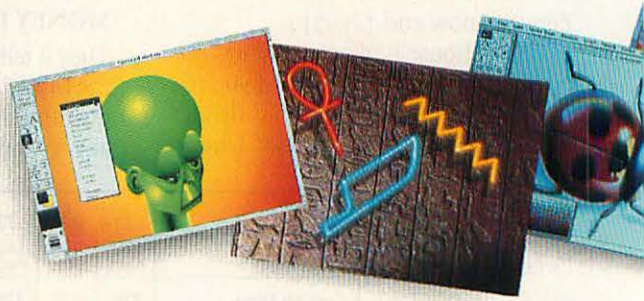
Have you noticed that some of the latest software requires too much memory to run on your Mac? Would you like to run MultiFinder plus two or more programs — all at the same time? Are you tired of having to quit your word processor just to answer a question from a spreadsheet?

Well, added memory is a must! Join the thousands of Mac users who are taking advantage of low SIMMs prices right now.

And quite apart from the ability to do multi-tasking, added memory speeds up your disk access time and eliminates delay when selecting menu items.

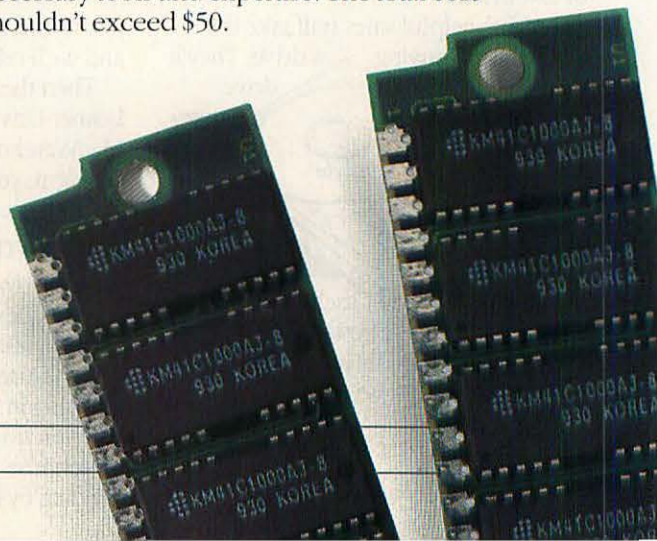
WHAT DO I NEED?

It couldn't be simpler. Call and we'll help you select the right Memory Upgrade for *your* Mac. We'll rush it to you overnight for just $3. You'll find installation at home is easy when you use our "step-by-step" instruction manual. Or, receive our new video, and watch



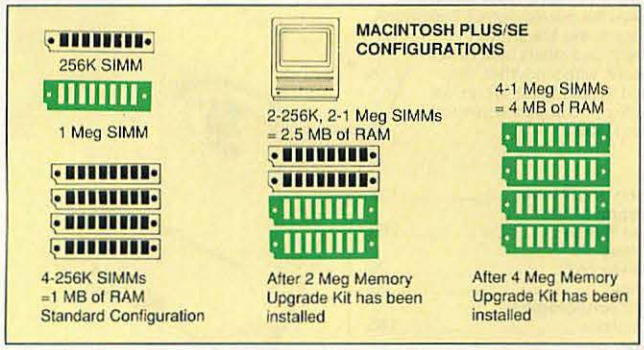
the process being done step-by-step. The video is free with the purchase of 2 or more SIMMs modules. ($29 if purchased separately.) The whole job should be completed in less than one hour. You'll need a simple tool kit, which is available for just $9.

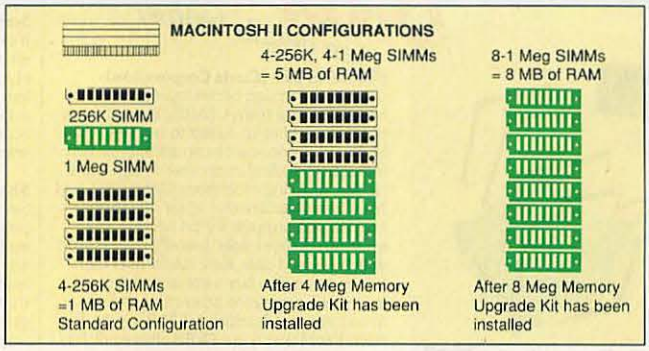
If you prefer, you can have a computer store install your SIMMs for you. Their service technicians have the necessary tools and expertise. The total cost shouldn't exceed $50.



The Mac Plus and Mac SE have four available slots on the motherboard, which originally contain four 256K SIMMs modules — totalling 1 megabyte (1MB) of memory. To upgrade, you can replace each 256K module with a 1MB module, but you must do this in pairs.

Replace two 256K modules and you will have a total of 2.5MB of memory. (That's the two new 1MB modules plus the original two 256K modules.) Replace all four modules and you'll have 4MB. (You should save the 256K modules for later use if you want to pass your Mac on to someone else.)





The Mac II, IIx, IIcx and SE/30 each come with a total of eight slots. The standard configuration has four 256K SIMMs modules, or a total of 1MB. Here, memory must be upgraded in multiples of four. This allows for expansion from 1MB to 4MB, 5MB or 8MB.

Remove the four 256K modules and replace with 1MB modules and you have 4MB. Leave the original modules and add four 1MB modules and you get 5MB. Removing the original modules and adding eight new 1 MB modules will bring you to 8MB of memory.

FAST, FASTER, FASTEST

SIMMs come in different speeds and are calibrated in nanoseconds (ns) from 70ns to 120ns. Anything faster than 120ns doesn't much help any Mac but the IIci. The system doesn't respond any faster anyway. But you can always take your memory chips with you when you move on to a new Mac, so there may be an advantage to speed at a later date.



QUALITY CONTROL

MacWarehouse buyers and agents scour the world in search of top quality components for our SIMMs modules. They're supplied only by top grade manufacturers like Samsung, Siemens, Texas Instruments, Fujitsu, Intel, etc. Each unit is tested for performance, quality and noise, in temperatures from freezing to 158°F.



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SIMMs Tool Kit ACC 0431	**$9**

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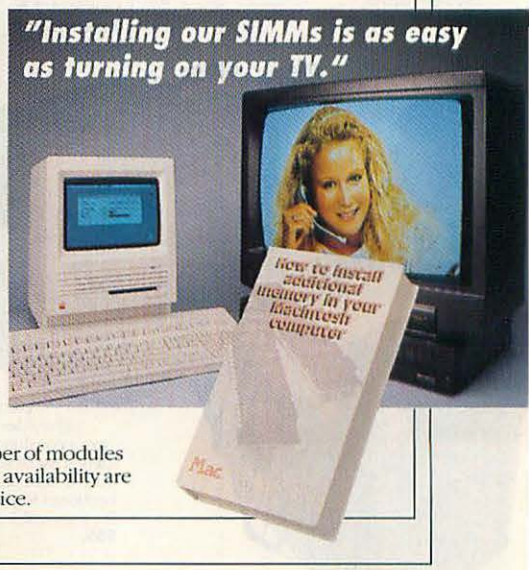
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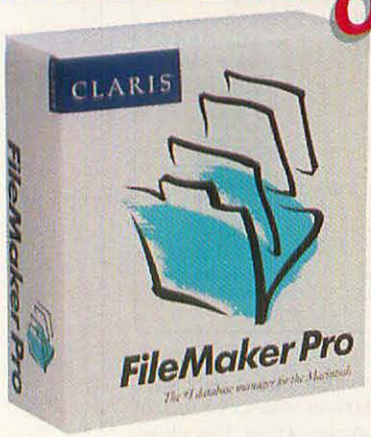
*Check the chart for the number of modules you may need. Price and item availability are subject to change without notice.

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GUARANTEE

Many of our products come with a thirty day money back guarantee. If you are not completely satisfied. Ask for details when you place your order.



FileMaker Pro (Claris Corporation)
Great new version of the top-selling database manager from CLARIS, is now more powerful and even easier to use than FileMaker II! Choose from an additional 100 features including improved design capabilities, drawing tools from Claris CAD and MacDraw II, a Size dialog for precision layouts and support for 64 colors. The program is more user-friendly than before with a revised data files. Multi-user capabilities have also been enhanced through improved password protection and selected views. (database) **$219**. Upgrades from FileMaker II are **FREE** after April 1st.

NEW!

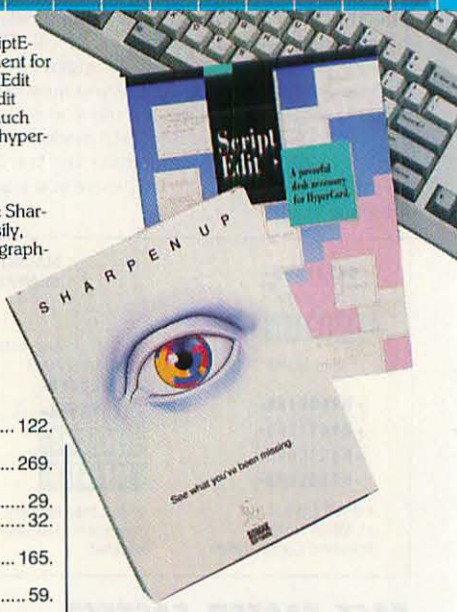
Mobius Products
SE Silencer 39.
Targus, Ltd.
Deluxe Plus/SE-XKB Case (black) 69.
ImageWriter II Case (black) 45.
Mac Plus/SE Case (black) 59.
IIcx /IIci Case 75.

UnMouse (Micro Touch)
The UnMouse does everything a mouse can - only faster, easier, and in less space. To move the cursor, simply slide your finger over the glass surface. To make a selection, merely press down. The UnMouse also serves as an extended keyboard. Tap the large red button and you have a Power Keypad with 16 keys instantly available to execute macros (60 in advanced mode). With its one million touch points the UnMouse also performs as a small graphics tablet. Requires a Mac with ADB port. (input/output) **$189**



ScriptEdit (Somak Software, Inc.)
If you use HyperCard, you need ScriptEdit, the critically acclaimed replacement for HyperCard's editing window. ScriptEdit lets you view one script while you edit another, search-and-replace, and much more! 4 mice! (MacUser 12/89). (hyperware) **$49**

SharpenUP
See what you've been missing! The SharpenUp utility installs quickly and easily, and makes the printed output from graphics programs like MacDraw, SuperPaint, and others look better than before, with smoother, finer grays and thinner lines! Works on any PostScript-compatible printer. (graphics) $59



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Computer Tool Kit (52 pc.) 49.
Disk Holder (holds 40) 9.
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MacTilt II-RGB 75.
I/O Designs
Imageware II Carrying Case 49.
Macinware IIcx Carrying Case 85.
Macinware Mac II Carrying Case 99.
Macinware Plus Carrying Case 64.
Macinware SE Carrying Case 75.
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The Ultimate SE Carrying Case 79.
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Excel 2.2 or PowerPoint 2.1 ea.245.
The Microsoft Office 525.
The Microsoft Office-CD 669.
Works 2.0 185.
Portfolio Systems
Dynodex-w binder & paper 69.
Paper 14.

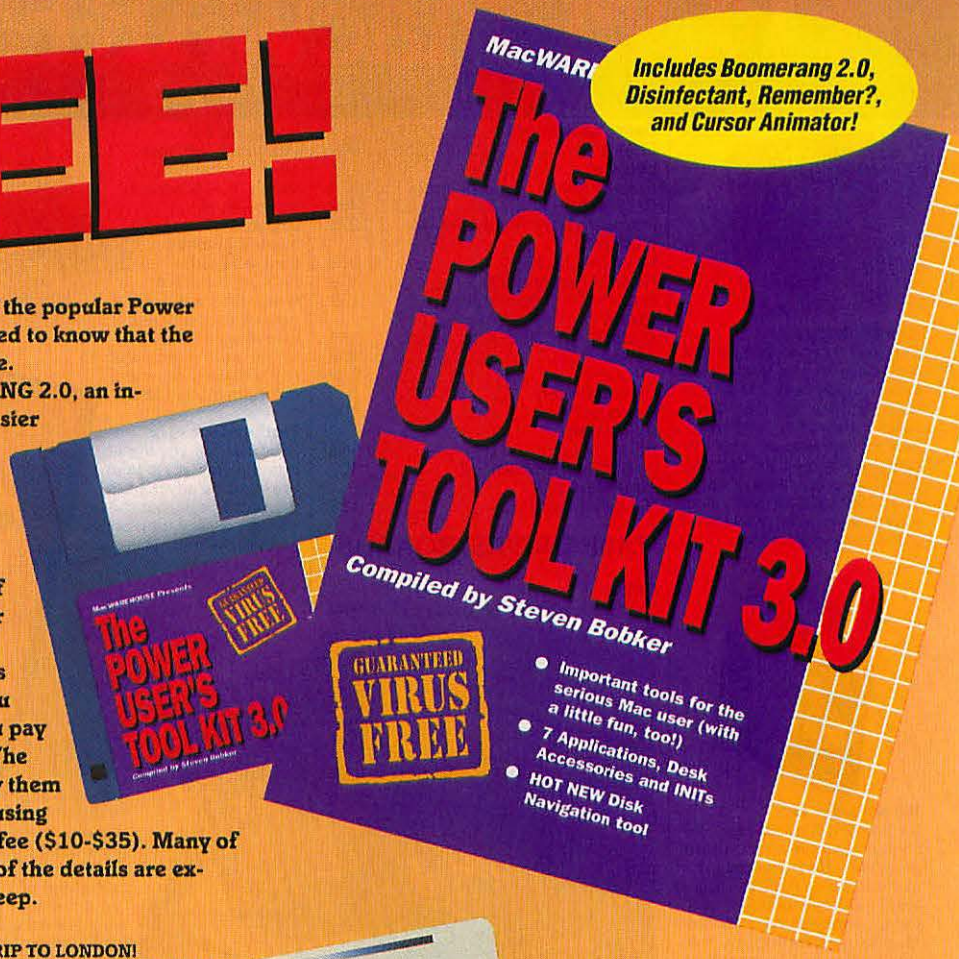


Macintosh SE/Plus w/Extended Keyboard Carrying Case (Targus)
Pamper your Mac with a Targus case made of Zilicone treated nylon to give you waterproof durability and an impact absorbing high-density foam layer with a soft protective lining for complete protection. Cushioned shoulder pad and handles provide extra comfort and convenience. Plus there's room for everything from your Mac, a hard disk drive, and the extended keyboard to pockets for your mouse, floppies, cables, and pens. (accessories) **$69.**

Enhance (Micro Frontier)
Picture Perfect. Advanced image analysis and enhancement package for the Mac II family. Enhance offers true 256 gray level support. It's the first program to offer an assortment of masking buffers and real time on-screen filters. Allows user's to paint, filter and precisely adjust gray scales within isolated parts of any image. (graphics) **$235**



FREE!



If you found the first two versions of the popular Power User's Tool Kit useful, you'll be delighted to know that the very latest version, 3.0, is now available.

The new edition includes BOOMERANG 2.0, an ingenious utility, which makes it much easier to use the SF Dialog (the dialog box that appears when you choose Open or Save from the file menu).

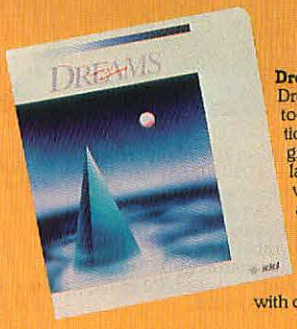
You'll also find the latest version of DISINFECTANT (anti-viral freeware) and REMEMBER?, a handy reminder of the day's events when you start up your Mac.

The POWER USER'S TOOL KIT 3.0 is FREE from MacWAREHOUSE when you order from us. If you want the disk, you pay only $1.50 for shipping and handling. The programs are shareware, so you can try them free of charge. If you wish to continue using them, some authors ask that you pay a fee ($10-$35). Many of the programs are absolutely FREE. All of the details are explained on the disk, which is yours to keep.

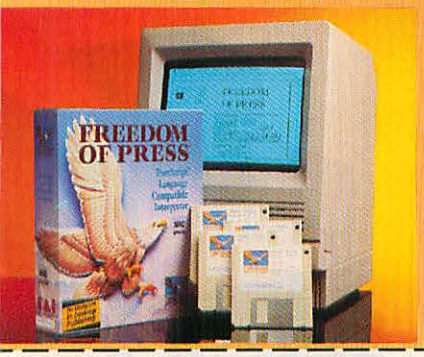


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There's still time to enter our latest contest and win an all-expenses-paid trip to the *MacUser* U.K. Show in London, November 7-10, 1990. Your name is automatically entered in to the drawing when you order from MacWAREHOUSE, Or, just fill out and mail the entry coupon below.

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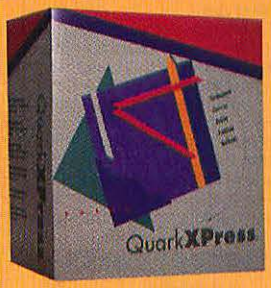


Dreams (Innovative Data Design)
Dreams offers a powerful precision drawing tool for professional scaled drawings, illustrations, presentations and general purpose graphics. Dreams provides zoom, rotation, layers, dimensioning, symbol libraries and a vast array of drawing tools, as well as many advanced illustration features. You can merge shapes together, cut edges of objects using other objects as templates...even glue lines and curves together to form unique shapes to be filled with colors or patterns. (graphics) **$319.**



Freedom of Press 2.1a (Custom Applications, Inc.)
Print PostScript language files using more than 50 different printers and film recorders. In combination with your favorite desktop publishing, graphics, drawing, painting and word processing software, Freedom of Press allows you to print PostScript language files, including support for 24 bit continuous tone color images. Complete with 35 scalable and rotatable outline fonts and drivers for all supported printers. Requires Macintosh SE30, II, IIcx, IIx or IIci. (utility) **$259.**

Quark XPress 3.0 (Quark)
XPress 3.0 boasts a more intuitive user interface, many new features, plus redesigned and reorganized documentation. New measurement and page palettes provide the user with interactive on-screen access. A library stores frequently used items, and a pasteboard provides a work area next to each page. You can group text and graphics as a single element and rotate them a full 360 degrees in 0.001 degree increments. Color trapping ensures precise color printing. (desktop publishing) **Call.**



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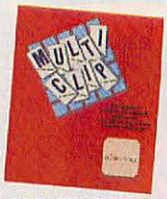
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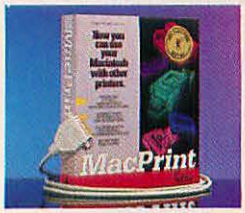
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The best scrapbook/clipboard replacement just got better. Why struggle with the limitations of your system, when MultiClip lets you have a multitude of clippings at your disposal! New and improved version 2.0 lets you print or name your clipboard activity, take advantage of 32-bit QuickDraw, and more.(utilities) **$69.**



White Knight 11
Successor to the legendary Red Ryder telecommunications program. New features list alone is more than 20 pages long! Comes bundled with Okyto, a revolutionary Mac-to-Mac file transfer program. Free subscription to GEnie network provided. (communications) **$85.**



MacPrint
Easy-to-use software utility that lets you use almost any Mac application on virtually any printer including HP LaserJet II and IID. MacPrint displays all your printer's fonts for true WYSIWYG performance. Prints text and graphics at your printer's maximum resolution. The cost effective print option for your Mac. (utilities) **$95.**



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End time consuming expeditions for hidden documents. Assemble documents in a special purpose database where information is compressed and indexed for rapid search and retrieval. Once stored, find and distribute documents based on content, author, title, commentary or archival date. (Utilities) **Single User $155. 5 Pack $519.**

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TimeWorks
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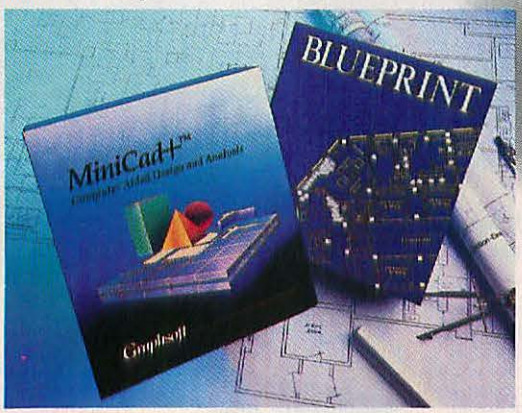
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FastLabel 2.0 (Vertical Solutions)
Stick it to the chore of simple label printing in three easy steps! Import addresses, lists and graphics then use FastLabel's preformatted templates (or create your own) to produce everything from disk, V.C.R. and cassette labels to name badges, signs and more. (business) **$89**

FastEnvelope - This handy DA lets you import lists and graphics to print eye-catching envelopes, then adds postal bar codes saving you time and money on bulk mailings. (business) **$50**





MinCad+ 3.0 (Graphsoft)
MiniCad+ 3.0, the price/performance leader in the Macintosh CAD market, adds a relational database and artificial intelligence in the form of a "smart cursor" to award-winning 2D/3D CAD that already contains a programming language and built-in translator. (CAD/CAE)**$519.**

Blueprint
Blueprint, rated best in 2D CAD by recent MacWorld review of 21 CAD products (July 1990). Offers professional 2D CD at an unbeatable price. Get all the features you need—unlimited layers, advanced auto-dimensioning, symbol library, color, high-precision, hatching, mirroring, DXF translation plus much more— at a price you can afford. (CAD/CAE) **$219.**

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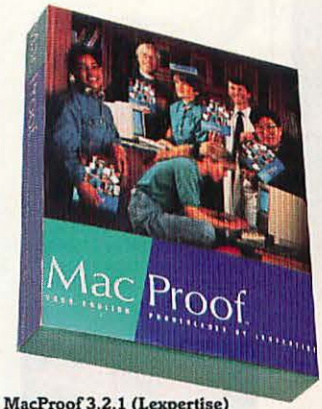
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The "ULTIMATE" SE Carrying Case (I/O Design, Inc.)
The "ULTIMATE" SE Carrying Case is designed with the same high quality standards as other MacLuggage products. This case offers internal, padded compartments for ANY Macintosh keyboard, mouse, external hard disk and cables. It also features 2 additional exterior pockets for everything from disks to umbrellas. Combine these features with sturdy Du-pont Cordura nylon and 1/2 inch high density foam padding and you'll see why this is the "Ultimate" carrying case for your Mac. Available in black and navy blue . (accessories) **$79.**



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MacProof 3.2.1 (Lexpertise)
You'll never get a second chance to make a first impression! MacProof 3.2.1 is your English proofreader. Without leaving your document, it proofreads all text written on your word processor: business, educational, personal and professional. MacProof is a desk accessory for the Macintosh Plus, SE, II, IIcx. Checks: Mechanics, Word usage, Writing style and Structure. You can customize the Usage and the Spelling dictionaries to your specific requirements. Compatible with MacWrite II V. 1.0, MacWrite V. 4.6 & 5.0, Microsoft Word 4.0, PageMaker 3.0, w/ 2mg memory, MindWrite V.1 and V.2.(spelling) **$115.**

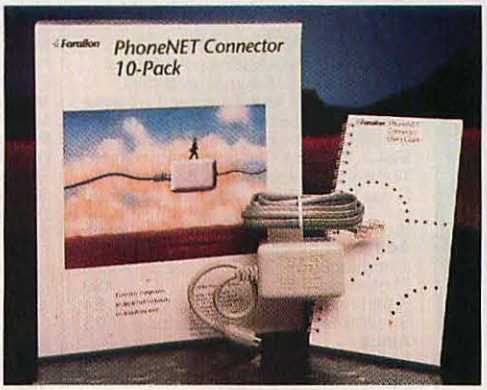
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Claris
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PhoneNET Connecter 10-Pack (Farallon)
PhoneNET connectors allow different devices such as computers, printers and file servers on an AppleTalk network to communicate with each other over ordinary telephone cables. This system offers increased reliability, low maintenance, cost effectiveness, extended network distances and flexible network layouts. Fully compatible with LocalTalk cabling, FlashTalk and DaynaTalk. (networking) **$249.**



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InSignia Solutions
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Microcom Software
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TOPS 3.0 Network Bundle 187.
TOPS DOS Network Bundle 165.
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Lap-Link III Connectivity Pac 119.
Lap-Link III Network Pac 185.

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Claris
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FileMaker Pro 219.
Fox Software
FoxBASE+/Mac 292.
Odesta
Double Helix III 389.
GeoQuery 229.
ProVUE
Panorama 257.

DESK ACCESSORIES

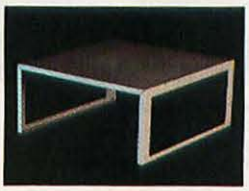
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Smart Alarms (5 - 8 users) 149.
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Colorset 1.5
Gray-scale scanners show their true colors with Colorset. Allows your gray-scanner to scan color images, then edit and save them as 8,16 or 32 bit PICT and color TIFF files. Its ShowScan function commands Hypercard to display color images in stacks. (graphics) **$229**



Mac IIcx/ci Monitor Stand
Mac IIcx Monitor Stand, from Basic Needs, saves desktop space while protecting the IIcx from the weight of a heavy monitor. Your IIcx or ci fits right underneath the stand and the 16 gauge steel frame provides solid support for any size monitor. Color:Platinum. (accessories) **$40.**



MediaTracks
MediaTracks lets you record whatever takes place on your Macintosh screen. Your audience watches "tapes " of that activity just as it appeared on your screen. MediaTracks comes with a full set of tools for editing and annotating tapes. Tape a common procedure once, and let people watch it at their convenience. (graphics) **$189.**



New! The ProModem 2400Minifax
The Minifax is a 9600 bps, send-only fax and a 2400bps data modem. Use the Minifax to send Mac documents directly to any Group III fax machine in the world, or use it as a 2400 bps data modem for connecting to online services, sending Email or transferring files. Includes new fax software, Maxfax, MacKNOWLEDGE, and a Mac cable. (modems/fax) **$209.**

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- C.O.D. orders ship via UPS (Blue Label if you are more than 2 days from us via UPS Ground). Charge is $6 including shipping.
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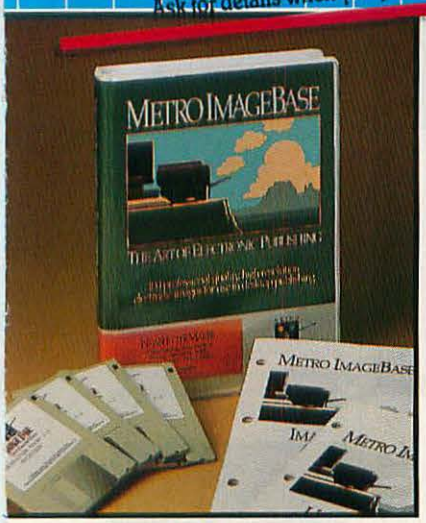


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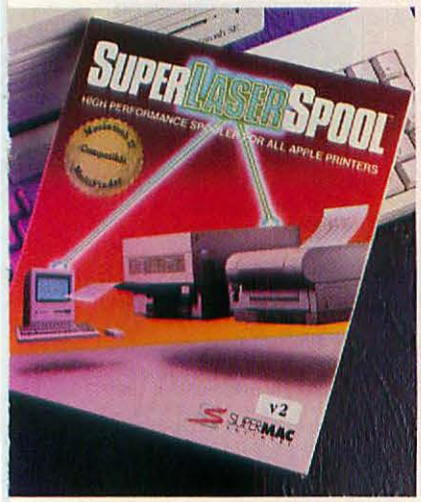
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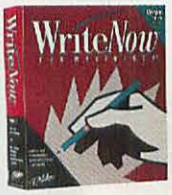
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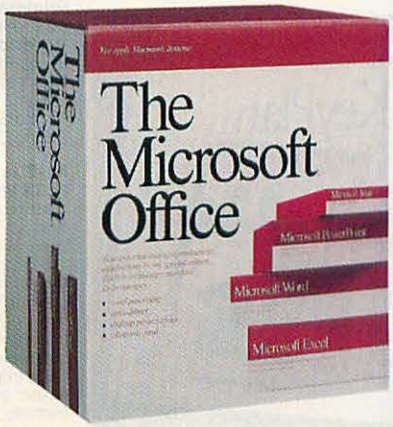
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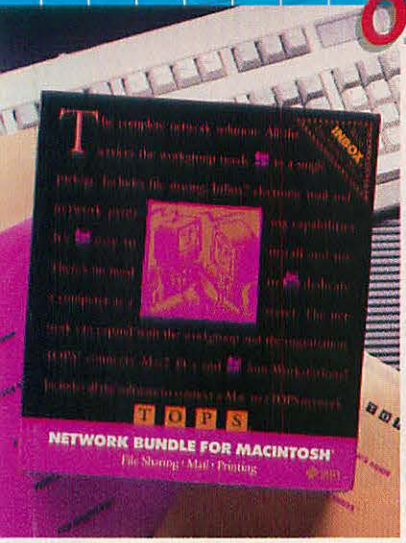
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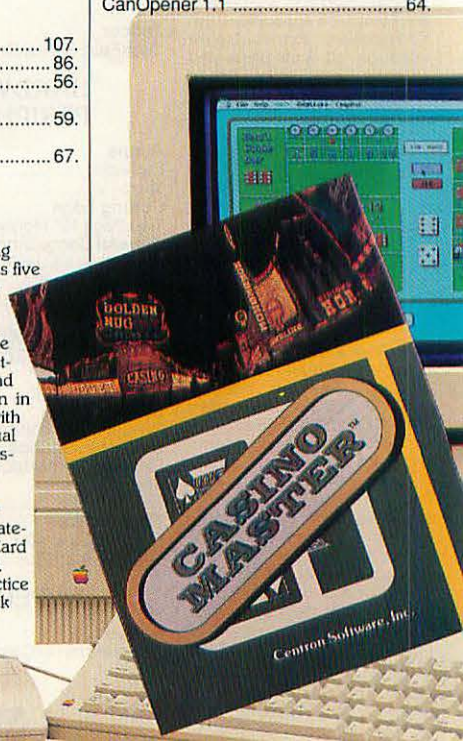
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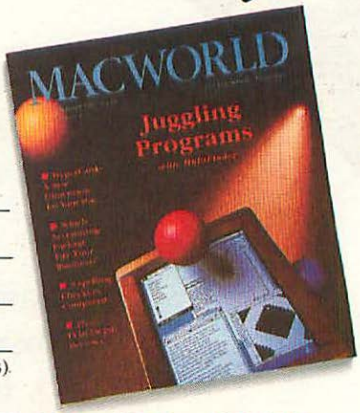
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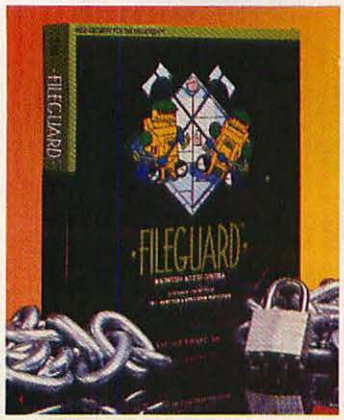
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When 90 photographers document a day in the life of China, you're looking at 143,000 photos. And no time to publish a 224–page book for the fall.

That's why the designers at Collins Publishers use Abaton scanners.

Scanning the photos into their Macs, the designers layout each page on the system. "We can see what each spread looks like, make any changes, and still have a printed record," says design director Jennifer Barry. "It saves us a lot of time."

The designers also scanned the Cantonese calligraphy and "Day in the Life of China" logo into their Macs with an Abaton Scan 300, for use on folders, press passes, shipping labels, and buttons. Which made each piece easier to produce.

Abaton scanners brought hand-drawn figures and calligraphy into Macs for finishing, sizing, and layout



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fer of Wizard data files to other Macintosh applications. Both programs do fine with the first two tasks and not quite so well with the third.

Software Links

Organizer Link has the feel of a scaled-down version of Focal Point, with similar buttons, fields, dialog boxes, and pull-down menus. The main menu displays five buttons, each of which leads to one of the stack modules: Telephone Directory, Schedule, Anniversary, Memo, and Transfer Text File (see "Focal Point Jr.").

Each of these modules lets you enter and edit data using the Mac keyboard and transfer Mac data to or from the Wizard. Data entry and editing is straightforward and should be clear to anyone familiar with HyperCard. Data transfer is slightly more complicated; you have to negotiate several dialog boxes to complete the process. While beginners may find these dialog reminders helpful, power users may be frustrated by the lack of shortcuts.

The Palmtop Link is a self-contained program that includes several miniapplications corresponding to the Wizard's functional modules. Each of these applications closely mimics the corresponding Wizard module while applying the Mac interface guidelines to make basic operations easier and more intuitive.

Since it's a stand-alone application, Palmtop Link has several advantages over Organizer Link. Palmtop Link is faster; the user interface is more Mac-like; and the unit enables you to open and view several windows, from different modules, at once (see "The Wizard's Many Faces").

On the other hand, if you're fluent in HyperTalk you might appreciate being able to customize and enhance the Organizer Link stack. An obvious first project in my book would be to add a phone dialer. For some strange reason, neither of these programs includes that rudimentary capability.

Missing Links

In order to accommodate users who prefer to work with more full-featured software packages, both programs can import and export data files in a variety of formats. But neither one lets you move data directly from the Wizard to another application or vice versa, and I found the multistep transfer process to be generally quirky and often unpredictable.

Most Macintosh users will probably prefer Palmtop Link's speed and simple, intuitive user interface, while HyperCard hackers will probably be happier with Organizer Link. Me? I'm still using a pen and my paper calendar and organizer with a 6-point laser-printed phone list tucked in the back of my wallet.—**George Beekman (with help from Eric Johnson and Bryce Jasmer)**

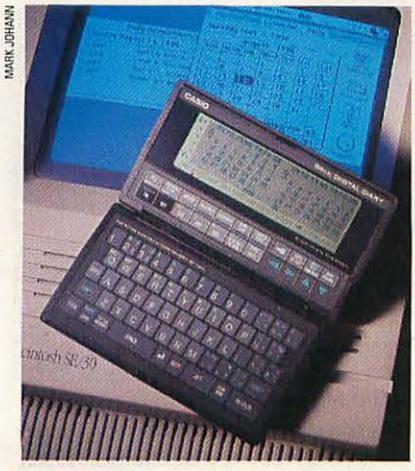
See **Where to Buy** *or circle 806 (Palmtop Link), 804 (Organizer Link) on reader service card.*

Communications Package

CASIOLINK FOR THE MACINTOSH

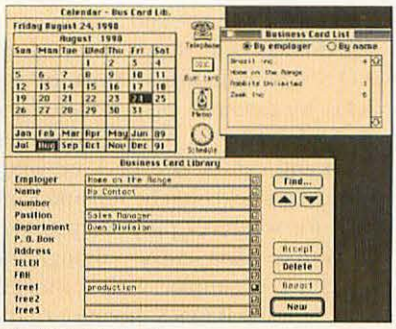
Pros: Easy data transfers; HyperCard stack support; simple importing and exporting. **Cons:** Some Mac characters don't translate properly; Mac database fields don't always close; no way to easily avoid duplicates during transfers. **Company:** Traveling Software. **Requires:** Mac Plus; Casio's B.O.S.S. **List price:** $109.95.

Hand-held personal-information managers are becoming increasingly popular. Many, however, have limitations that restrict their use to the most trivial tasks. A 2-line display may be fine for a simple phone directory, but the people that I want to call have first and last names, a company name, and—in most cases—an address. Some even have fax machines.



MARK JOHANN

Casio's B.O.S.S.



CasioLink in Action

The top left window is Mission Control for CasioLink. Clicking on its icons displays the program's various components. The Business Card List (upper right) is handy for quickly flipping to any record in the Business Card database. Gray boxes next to a field (bottom window) indicate scrolling fields.

Sure, any Macintosh database program can handle this situation. But I'm not always in front of my Mac, and I don't own a Macintosh Portable. The pocket-size Casio's B.O.S.S. (Business Organizer Scheduling System) is just about the right size for my portable organizer and offers considerably more flexibility than a paper printout. The Casio model SF-7000, for example, has a 6-line display and comes with 64K of RAM—more than enough memory to handle impressive telephone and business-card databases, months of schedules, and numerous memos. Although it has a diminutive keyboard, for sheer power the B.O.S.S. is almost on a par with many of the early notebook computers, such as the Tandy Model 100.

CasioLink

CasioLink allows a free interchange of data between the Mac and the B.O.S.S. The package consists of two parts: the CasioLink program and a set of connecting cables that run between the Mac and the B.O.S.S. The two-piece cable connects the B.O.S.S. to the Macintosh's modem port. The cable that hooks to the B.O.S.S. has a single-pin connector. On the other end is a split cable with a DB-9 connector on one branch and a Mini DIN-8 on the other.

The CasioLink program is designed to mimic the B.O.S.S.'s built-in functions—telephone and business-card

(continues)

directories, memos, and appointment scheduling—and shares many of the B.O.S.S.'s limitations. Most of the fields, for example, are prelabeled and cannot be changed. All fields, however, scroll and can be set for word-wrap. The last six fields can be renamed and used for whatever purpose you like. Of course, data entry, editing, and searching is simpler with CasioLink than with the B.O.S.S. because of the Mac's full-size keyboard and greater computing power.

You initiate all data transfers from CasioLink. Whether you choose to send or receive data, the program displays a dialog that clearly lists the steps needed to perform the transfer. There are some limitations, though; total data cannot exceed 64K (a B.O.S.S. limitation), and field contents should be restricted to standard ASCII characters (no Apple symbols, Zapf Dingbat characters, and so on.)

The most-common transfer problems are those caused by a loose cable or by issuing commands in the wrong sequence. Both situations, however, are easily corrected.

CasioLink's only serious limitation is that you have to keep track of which records are new before you set about transmitting them; neither the B.O.S.S. nor CasioLink can screen for duplicate records. So unless you're careful or export to a new file, you frequently have to do some judicious editing (deleting records, for instance) following transfers.

Import and Export

In addition to its ability to send and receive, CasioLink can import and export tab- or comma-delimited text files. This makes it fairly painless to take an existing address file from almost any other database program and, after a bit of clean-up, pass it on to the B.O.S.S. CasioLink also provides import/export buttons that can be pasted into Apple's HyperCard Datebook and Address stacks.

If you already own a Casio B.O.S.S., this package will make a fine addition to your Macintosh repertoire. And if you're thinking about buying a B.O.S.S., the availability of CasioLink may be the justification you've been waiting for.—**Steven Schwartz**

See **Where to Buy** *or circle 719 on reader service card.*

Adventure Game

THE BARD'S TALE 1.0

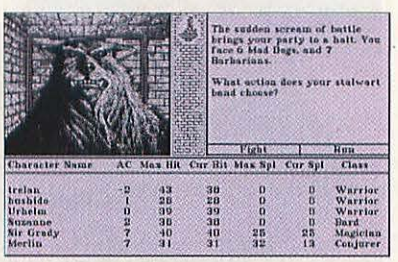
Pros: Nice combination of problem solving, combat, and exploration; medieval lute music. **Cons:** Monochrome only; repetitious. **Company:** Electronic Arts. **Requires:** Mac 512K; System 6.0.2. **List price:** $49.95.



The Bard's Tale is an interesting combination, an adventure and puzzle game that challenges you to lift an evil spell from an ensorcelled medieval city. You start off in the Guild Hall, refuge of the few fighters, bards, thieves, and magic users still resisting the city's new and evil denizens. You put together a party of these adventurers (or use a supplied group) and sally forth to fight monsters, find treasure, solve puzzles and, in the case of the bard character, knock back a few brewskis.

Gee, Is It 3 a.m. Already?

Basically I found The Bard's Tale to be addictive once I became familiar with the interface, which, although generally good, at first made finding my way around the city slightly confusing. (There's an arrow that shows what direction you'll go if you click the mouse, and it's good to know that when the arrow curves back on itself you'll make a U turn.) The programmer did an impressive job of packing in a lot of good-looking mazes, monsters, taverns, temples, and so on. And because the designer used a few building and background designs in different permutations and added just a touch of animation to the well-drawn monsters and characters, you get a lot to explore and a lot of playing time for your money.



As the Monster Turns . . .
Various opponents, human and otherwise, threaten the very electronic lives of the adventurers as they struggle to improve and overcome evil.

However, to win the game you *must* put in plenty of playing time. The Bard's Tale requires you to solve nearly all of its mysteries. While you plow through the game, you must keep as many magic items as you can (selling them to the weapons shop is a good way to keep them available for later repurchase), and *you must map everywhere you go.*

Maybe a Macro Would Help

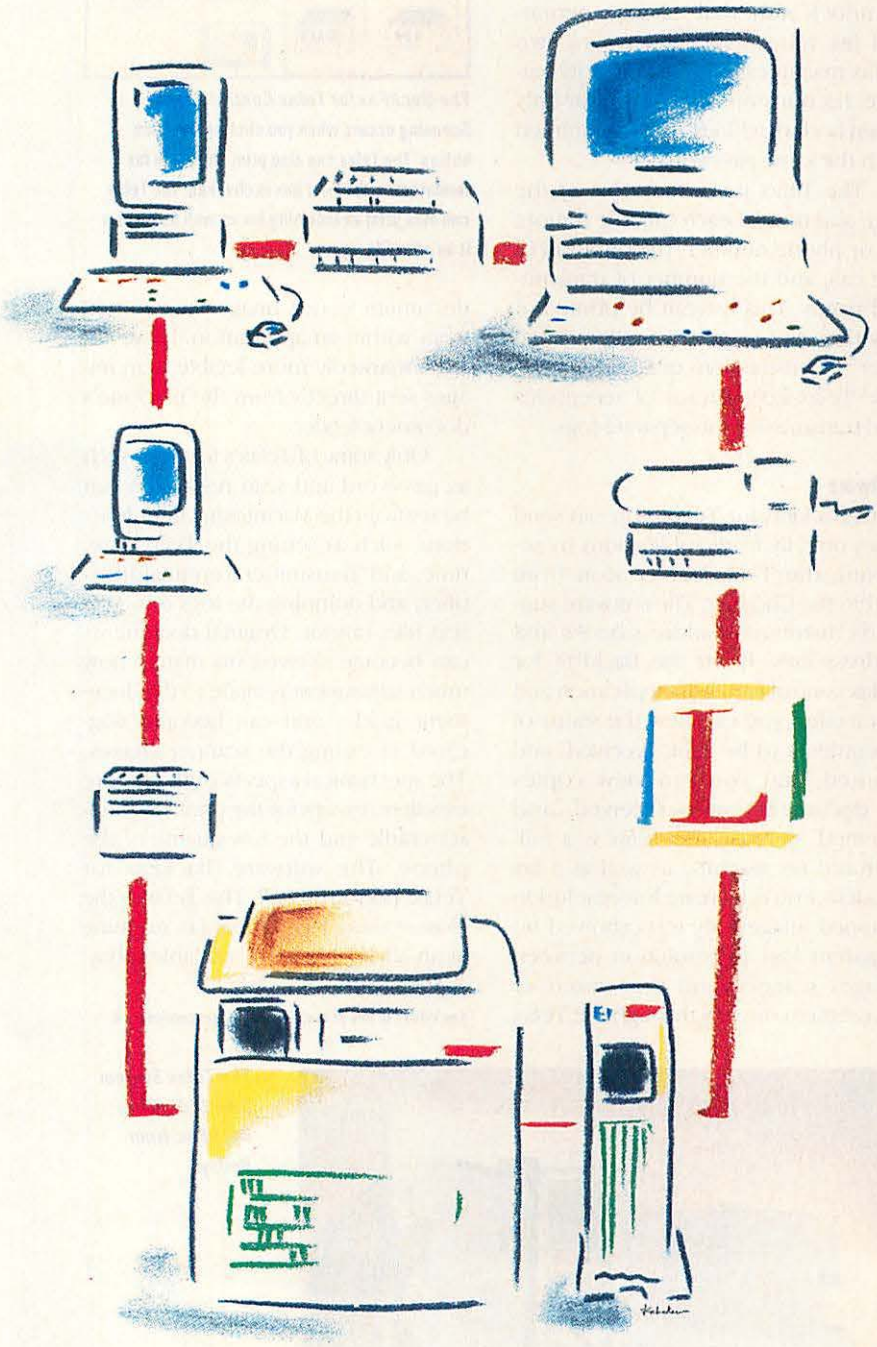
One annoying thing about The Bard's Tale is that you have to fight a lot of battles—a bit boring after a while. After every battle, however, you do find a box of treasure. That's fun, but it almost always entails disarming a trap. After you advance in power you simply use your spell points to blow the darn things open, which is oddly satisfying. After a (long) while, you become immune and can essentially ignore the traps except for mapping purposes. Sometimes the only thing that saves you when you're lost is your careful record of the traps and magic areas.

Other tips: the only way to save the game is to quit from the Guild Hall (home base). When you quit it's a good idea to make a copy of the character folder so you can start up where you left off if your party gets wiped out. If you have to reboot, you lose all your gold, which can mean your party can't afford the temple healers.

Although the game's situation and setup seem similar to tabletop fantasy role-playing games refereed by people, there is no character development in The Bard's Tale, just the slow accumulation of experience, magic items, magic spells, and power. I did find it amusing that my bard character was always ducking into the nearest pub, if only to restore his magical vocal cords. But if you're looking for more than a canned conversation with the barkeep or would like to really test your wits against a wily and cantankerous sage, try one of the many tabletop role-playing games. If you love exploring and mapping mazes, fighting ever more numerous and dangerous monsters, and assembling the parts of a puzzle, then The Bard's Tale is for you.—**Tom Moran**

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Circle 205 on reader service card

Fax Modem

TEFAX SYSTEM RA-2110 WITH BACKFAX

Pros: Versatile. **Cons:** Document-feed mechanism periodically misaligns; awkward setup; some functions not available from the Mac. **Company:** Relisys. **Requires:** Mac Plus; hard disk; System 6.0. **List price:** $1595.

The ideal fax machine, in my opinion, should be a 9600-bps Group 3 fax modem, be able to copy and print documents, be a standard voice telephone as well as a modem, and be portable. It should be capable of background and foreground operation and be able to send a fax from within applications.

The Perfect Hardware Design

The Tefax System RA-2110 is a 14-pound unit that is 5 inches high, 14 inches wide, and 11 inches deep. When the cover—which doubles as a paper catcher—is open, the unit is 22 inches deep. Placement on the desktop is important. You need to make space for the original document, the received faxes, and the telephone handset cradle, which attaches to the side of the unit. The horizontal resolution is 203 dots per inch, and the vertical resolution is 98 dpi (normal) or 196 dpi (fine). The Tefax holds only 5 pages at a time in the document-feeder tray. The maximum document width is 8½ inches, minimum width is 5 inches, and maximum paper length is approximately 40 inches. The transmission protocol supports both CCITT Group 2 and Group 3 modes.

The frail push-button phone resides in a cradle mounted on the side of the machine. The cord, however, is too short and quickly becomes stretched. The phone's cradle is not removable and does not secure the phone when you move the fax machine.

Features

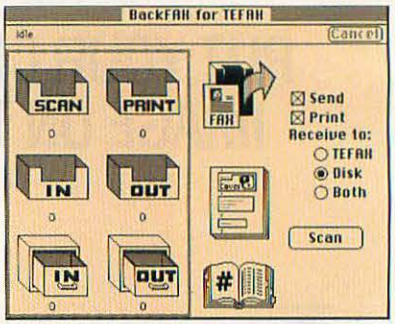
You set the Transmitter Terminal Identifier (the name that appears at the top of a received fax), transmitter telephone number, date, and time using the four-button user interface. The extremely awkward modified point-and-click technique allows you to select only one letter or number at a time. It is very easy to make mistakes, and you can edit only by restarting.

With the Polling feature, the Tefax can call and retrieve pending faxes from another machine. The Tefax also has a security feature that validates permitted fax transmissions between two Tefax machines. With the security feature, fax transmissions can occur only when both machines are programmed with the same password.

The Tefax maintains a list of the date and time of each call, the remote ID or phone number, the duration of the call, and the number of transmitted pages. This list can be printed at any time and is automatically printed after 50 transmissions or 50 receptions. The Tefax keeps track of receptions and transmissions in separate logs.

Software

With BackFax for Tefax, you can send faxes directly from applications by selecting the T MailServer icon from within the Chooser. The software supports distribution address books and address lists. From the BackFax for Tefax control panel, an application and not a cdev, you can view the status of documents to be sent, received, and printed; and you can view copies of documents sent, received, and scanned. Because the Tefax is a full-featured fax machine as well as a fax modem, you can create low-resolution scanned images. My tests showed no apparent loss of resolution between images scanned and then faxed or images sent directly through the Tefax document feeder. Images transmitted from within an application, however, were markedly more legible than images sent directly from the machine's document feeder.

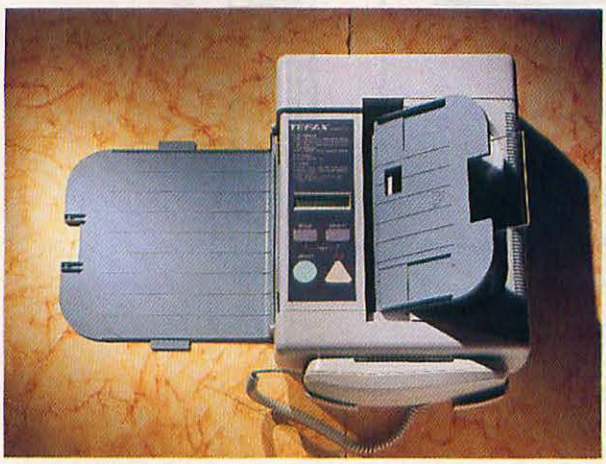


The BackFax for Tefax Control Panel
Scanning occurs when you click on the Scan button. The Tefax can also print any file in fax format when the Print box is checked. The Tefax can also print an incoming fax as well as receive it as a fax file.

Only some of Tefax's features, such as password and scan resolution can be set from the Macintosh. Other functions, such as setting the Tefax date, time, and Transmitter Terminal Identifier, and dumping the logs into Mac text files cannot. Original documents can become skewed no matter how much adjustment is made to the document guides and can become dog-eared in exiting the scanner chassis. The mechanical aspects of the fax are excellent, except for the phone's handset cradle and the low-quality of the phone. The software, BackFax for Tefax, performs well. The Tefax is the closest thing to an ideal fax machine at an affordable price available today.

—Steve Sanz

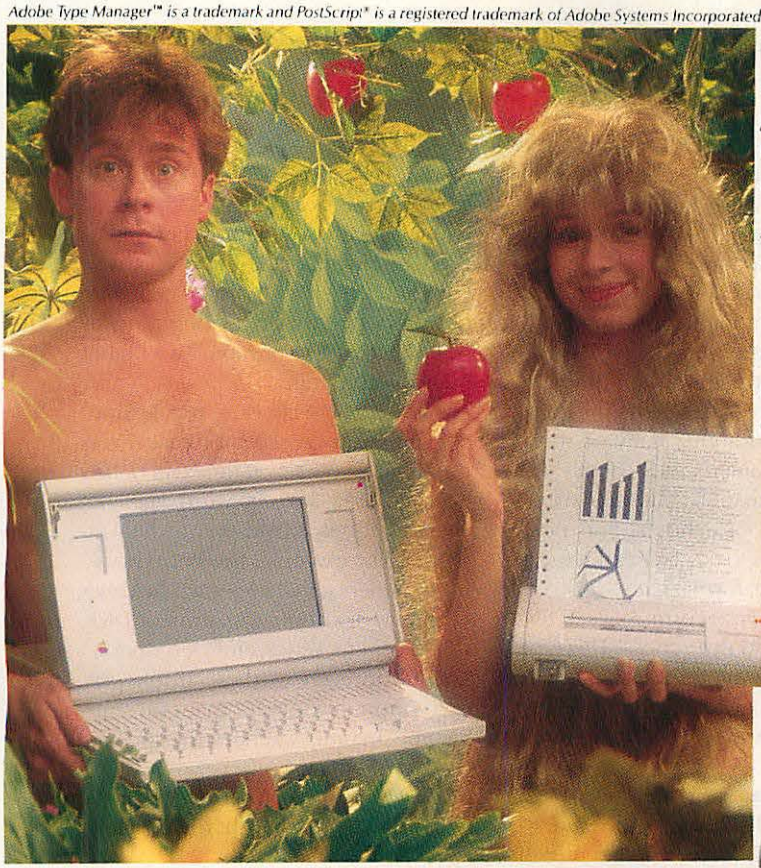
See **Where to Buy** *or circle 856 on reader service card.*



MARK JOHANN

The Tefax System RA-2110 with BackFax, from Relisys

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Job Hunting Tool

THE RESUME KIT 1.0

Pros: Includes résumé builder with preformatted sections, contact database program, and appointment calendar.
Cons: Limited control résumé format; you can't easily modify type of résumé; very awkward spelling checking.
Company: Spinnaker Software.
Requires: Mac Plus. **List price:** $59.95.

If you are looking for a new job, Spinnaker Software has designed The Resume Kit with you in mind. It has an interface that lets you concentrate on describing your job strengths, rather than worrying about how your résumé looks on the page. Actually, the program does more than just help you write a résumé. It also includes a simple job-contact database program for tracking job leads, and an appointment calendar for scheduling interviews. The manual even offers job-hunting hints, such as where to find good leads for jobs and how to conduct yourself at a job interview. Unfortunately, The Resume Kit misses the mark in a few critical areas.

The Resume Kit functions like a database. The program asks you to fill in data for various sections of a résumé that have titles like Experience, Personal, Job Objective, Education, References, and then lets you select which sections you want to include in the printed résumé. When you first start the program, you are asked to select one of the nine résumé types. Your choices are General, Quick and Easy, Standard, Business, Professional, Engineering, Student, Computer, and Academic.

Each résumé type has several predefined sections that are designed to emphasize the skills required for that kind of profession. For example, the Student résumé has predefined sections called Education, Activities, and Organizations. The Computer résumé includes a section entitled Education, but it also has sections called Computer Skills and Awards and Honors.

You can have up to ten sections in a résumé, which means you can add to the predefined sections required for each résumé type. And each of these sections can have one of ten different formats: Title only, Free Form, Computer/Language, Education, Business Experience, General Experience, Organizations/Societies, Skills/Activities/Awards, Publications, and References.

As the names suggest, some formats are very structured—for example, Business Experience, General Experience, and Education. Many of these section formats include boxes for specific information, such as dates, organizations, or schools, and position or job title (see "General Experience"). Other formats are unstructured, such as Free Form, Skills/Activities/Awards, and References. This type consists of an empty page or several large boxes in which you can write anything you want.

The Standard Type

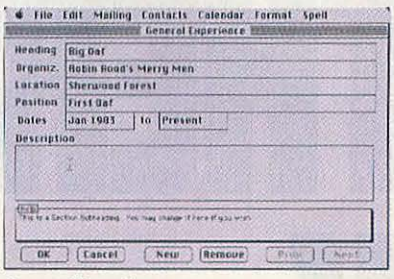
You're best off selecting the Standard type résumé. It has sections entitled Objective, Experience, Education, Personal, and References, plus five additional sections that you name and format yourself. Just because you have included a section in this part of the program, doesn't mean you have to include it in your printed résumé, so be creative. The program prints only the sections you select, in the order you select them. The program automatically makes sure everything is formatted properly.

Don't Change Your Mind

Be forewarned, once you select the type of résumé you want to use, you can't change your mind. Although much of your résumé information would be appropriate in many of the résumé types, once you select a résumé type, you cannot change it without reentering all of the data you've already typed in—a task made even more difficult by the fact that copy and paste functions are generally not supported within the program. All of this makes The Resume Kit a highly inflexible program.

The spelling checker, too, is time-consuming and awkward to use. Even though it is touted on the back of the package as a 100,000-word spelling checker, it only works on one field at a time. For example, the entry blank for Experience includes such fields as Company, Location, Department/Division, Position, Dates, and Description. You fill in each of these blanks for each position you want to list on your résumé. In order to check the spelling however, you must select each of those fields individually, for each position you list, and then run the spelling checker.

Formatting the résumé is another area I found frustrating. You can specify the font and style for headings, subheadings, and the body of the sections in your résumé. Although that may sound like a lot of control, you cannot make any other alterations. Because of that, you cannot properly format the title of a magazine article or book. Nor can you add any formatting to the name of a company you worked for, even if it would help identify it to the reader. If you are used to working with a word processing program that allows formatting at the word and letter level, or that has a find-and-replace function (and which one doesn't?), to be so limited is frustrating.



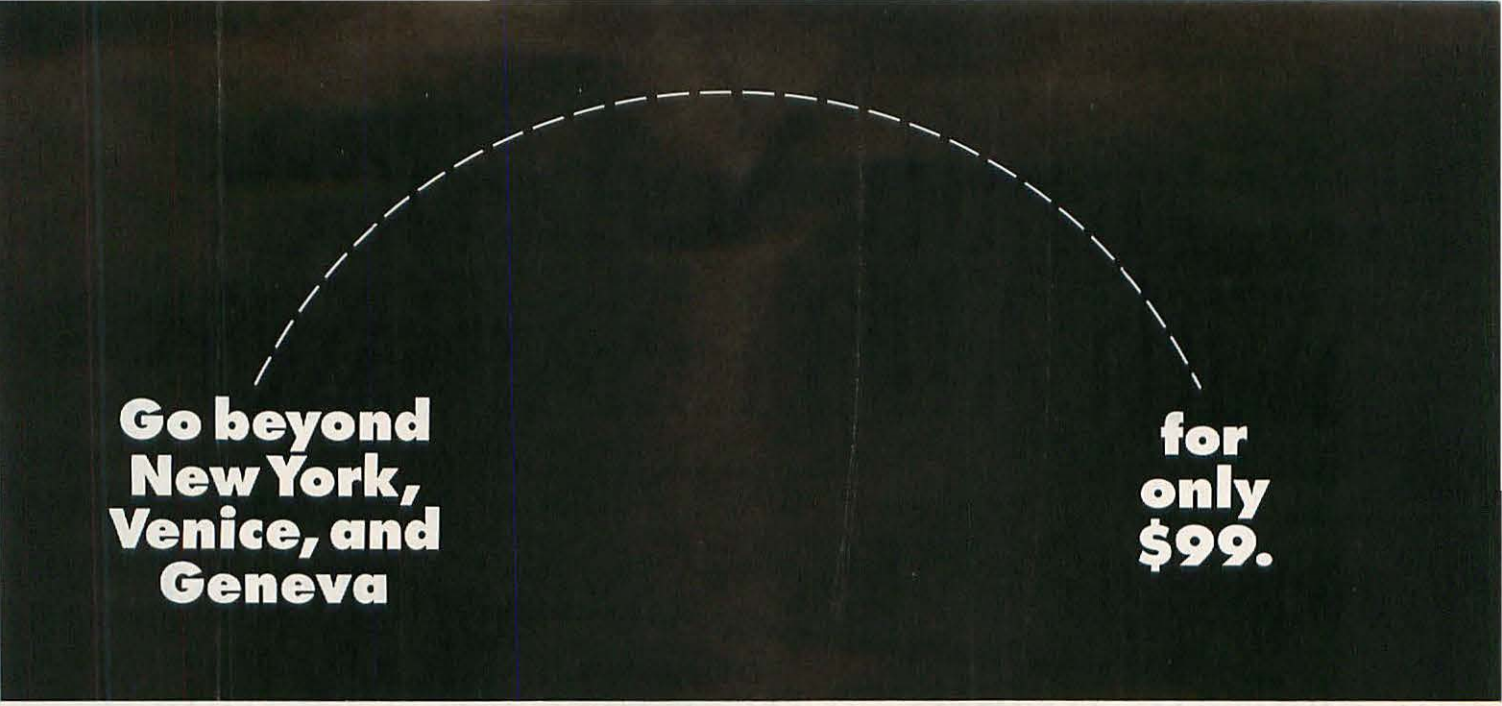
General Experience

The Resume Kit's General Experience section asks you to fill in your job experiences in a structured format. That way you can focus on what you've done rather than on how to format your résumé.

Job Trauma

Looking for work can be highly traumatic, and this program might provide a needed sense of security. If you know what you want to say in a résumé, but you're not sure how it should look, The Resume Kit can help you. However, the package has a list price of $59.95, and I think your money would be better spent buying a book on job hunting that includes a section on résumé formats (most do) and using your own word processor to write a résumé.—**Brooks Hunt**

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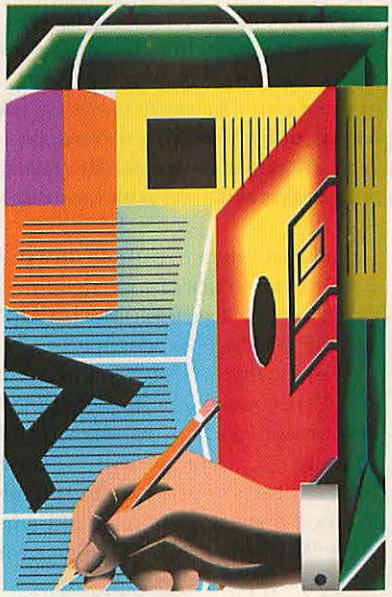
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WINDOW SHOPPING

by Lawrence Stevens

This month I review three Microsoft Excel template sets that help you track personal finances

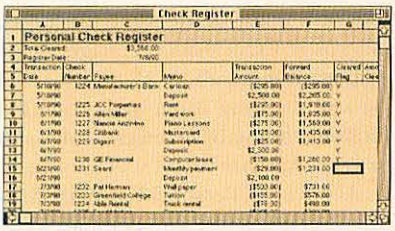


RON CHAN

Microsoft Excel Money Manager

Most of the people who take Microsoft Excel courses have had the program on their hard drive since they bought their Mac but have never created a spreadsheet. Most of them own a business, have investments, and enough money to complicate their personal finances. Still, they typically maintain their checkbooks, track stocks, and estimate their taxes using a pen and calculator. The problem is that while it might take half an hour to learn enough about Microsoft Word to be able to write and format a simple letter, you really have to learn how to use Excel before you can do anything with it. That's why beginning with a set of ready-to-use templates is an excellent idea.

For those who want to use a template set both for functionality as well as for learning, Microsoft Excel Money Manager ($34.95 from Microsoft Press) is the best of the lot. It includes a total of 31 templates, charts, and macros on eight personal-finance topics. The templates are attractive and easy to understand; the macros are efficiently programmed and the 265-page manual is an excellent primer on personal finances as well as a guide to using and customizing the templates and macro code.



Electronic Check Register

This Check Register template from Microsoft Excel Money Manager automatically figures your balance and the total amount of uncleared checks. Microsoft Excel Money Manager has the most attractively formatted templates.

There are templates for maintaining a check register, planning a budget, determining monthly costs for paying off a credit-card balance in a given time period, comparing the benefits of buying versus renting a house, estimating the amount of life insurance you need, and preparing some federal tax returns.

What I like most about Microsoft Excel Money Manager is that you get as much information from the manual as you get functionality from the software. Each of the nine chapters begins with a 2- or 3-page general discussion of the financial topic. For example the Personal Financial Statements chapter expounds the meaning of zero-based budgeting, contingency allowances, expense and spending breakdowns, and variance analysis.

The manual describes in general what the template, chart, or macro does and then, in the case of templates, gives a cell-by-cell description of what data to input. Finally, the manual describes how the template or macro works. You don't have to read this description if you are only interested in results, but if you want to learn how Excel works—what each function in the template or each line of code in the macro does—the manual can remove much of the mystery.

My favorite section is Managing Your Debt, which contains the second-largest number of templates and charts in the book. The Fixed-Rate Amortization Schedule allows you to enter the loan amount, term, and interest rate. It then gives you a table showing how much of each payment is interest and how much is principal. It also displays the remaining balance after each scheduled payment. You can even have the program show you the effects of paying more than the minimum payment amount. The Adjustable-Rate Amortization Schedule is the same as the Fixed-Rate except that you have to input the interest rate for each payment period.

The data in both these schedules can be viewed in beautifully formatted charts. A line chart shows the loan balance over the course of the loan, and an area chart shows the interest, principal, and extra payments of the loan.

A final template in this section, Credit-Card Manager, shows the cost of using your credit card and displays the monthly payment needed to pay off a loan in any number of months.

This set does have a few minor weaknesses. The main one is the Federal Income-Tax Return templates. The 6 pages devoted to explaining tax law barely scratch the surface. And while the worksheets do an accurate job of figuring taxes, you cannot print and mail these documents to the IRS.

(continues)

You have to hand-copy or type the information onto an actual form.

I would also like to see more linking of spreadsheets. For example, if the Personal Expense template were tied to the Check Register template, it would be easier to compare actual versus budgeted expenses. At the very least, the uncleared checks in the Check Register template should be automatically entered into the Bank Reconciliation template.

Bookstore shelves are filled with Excel how-to books that require you to input the formulas and code yourself. I strongly advise buying Microsoft Excel Money Manager for just a bit more money.

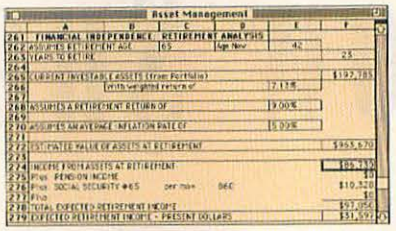
Personal Financial Planning Set

Personal Financial Planning Set ($96 from Heizer Software) is more expensive, covers fewer areas, but shows a deeper knowledge of financial planning. The package also differs from Microsoft Excel Money Manager in that Personal Financial Planning Set deals primarily with long-term planning and not day-to-day operations such as balancing a checkbook.

In two cases Personal Financial Planning Set directly competes with Microsoft Excel Money Manager. The Insurance Analysis template goes beyond analyzing life-insurance needs and includes sections on health, auto, homeowners', and disability policies. And the Tax/Cash Flow template allows you to compare, in side-by-side columns, the consequences of tax-related activities. The Tax/Cash Flow template also provides a three-year projection to help you determine how best to maximize cash flow and minimize taxes.

Of the three other templates—the Education Financial Analysis, Asset Management and Financial Independence, and Estate Analysis—the Estate Analysis template is the most complex. It allows you to determine settlement costs in the transfer of assets after the death of a spouse.

The biggest problem with the Personal Financial Planning Set is that the manual is only 11 pages long when printed out. Not only does it fail to explain either the workings of the templates or the financial concepts behind them, it doesn't even fully describe what values to place in the cells. Because of the lack of good documentation, this package probably shouldn't be your first Excel experience.



Financial Independence

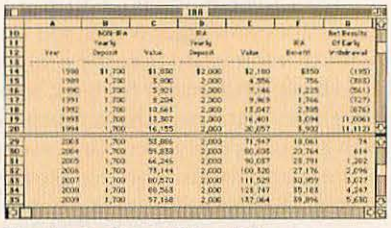
The Asset Management template from Personal Financial Planning Set helps you determine exactly what you need to do to become financially independent by the time you retire. You only input your desired retirement age. The program takes data from other areas of the template to determine your total assets; figures the effects of interest, dividends, and inflation; and gives (in today's dollars) the amount you will be living on when you retire.

Personal Financial Planning Set is detailed enough for professional financial advisers and for people with the time to experiment with various courses of action, who have the money to need financial planning, and who are willing to learn Excel on their own. For these people it is excellent.

Templicity

Perusing the 100 Excel templates in Templicity ($34.95 from The Sterling Connection) is a bit like browsing through those discount gadget stores. You leave loaded with doo-dads, half of which you will never use, but you still consider it a bargain. Likewise, even if you only end up using 25 or 30 of Templicity's templates, you won't begrudge the price.

The templates are arranged in five sections. The 50 Small Business templates help you track payables and receivables, determine selling price, tally the value of your business, and create a balance sheet. The 13 Real Estate templates create amortization tables, compare homes that you are considering buying, and keep rent records.



Figuring the Value of Your IRA

This IRA template from Templicity figures the value of an IRA and compares that value with a non–tax-deferred account. In this example, an IRA is a better investment plan as long as it remains on account for at least 15 years (1988 to 2003).

The program's Household and Miscellaneous sections are more frivolous and in some cases more creative. There are templates for figuring the number of calories you will have to eliminate to achieve a goal weight, for tallying the cost of house remodeling, for creating a calendar, for charting your biorhythms, for keeping score with a generic scoreboard, and for converting 45 different currencies into dollars.

The documentation for each template is even skimpier than for Personal Financial Planning Set, and Templicity does not contain macros or linked worksheets. But its templates are fully workable, and its selection of templates address some topics not addressed by the other packages reviewed here.

For example, Templicity has templates for figuring the finance charges of a new car, the hidden costs of a charge-card purchase, whether or not you are in a position to take on additional debt, and the relative advantages of term insurance versus whole-life insurance.

The tax forms in Templicity are equal in function to Excel Money Manager's forms, but Templicity's forms are not as attractively formatted, and they are on one worksheet rather than on a set of linked worksheets as in Money Manager. Linked worksheets are easier to manipulate.

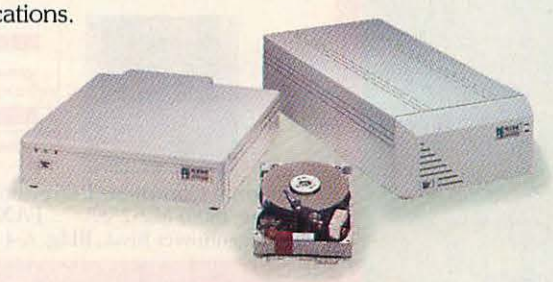
While these three template sets perform many of the same functions, Microsoft Excel Money Manager helps you learn more about Microsoft Excel as well as giving you a well-grounded understanding of financial analysis. If you are familiar with Excel and financial concepts, Personal Financial Planning Set helps you with complex long-range planning. And Templicity gives you some quick-and-dirty analyses and a lot for your money. M

See* Where to Buy *or circle 783 (Microsoft Excel Money Manager), 809 (Personal Financial Planning Set), 858 (Templicity) on reader service card.

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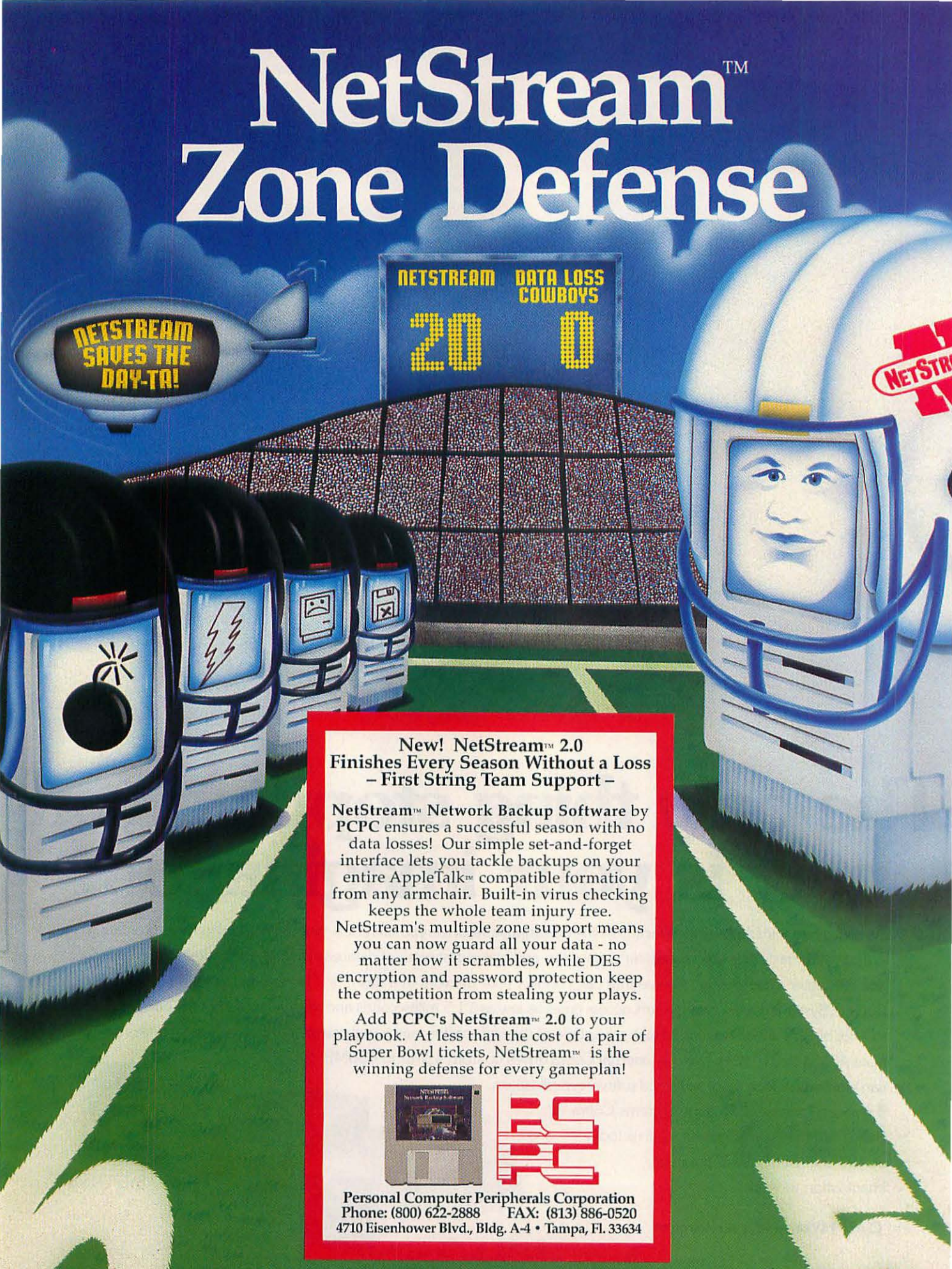
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NEW PRODUCTS

Edited by Mary Margaret Lewis

This section covers Macintosh products formally announced but not yet evaluated by Macworld. All prices are suggested retail. Please call vendors for information on availability.

HARDWARE

16" Trinitron Display

16-inch display with refresh rate of 75Hz. Has footprint that is small enough to fit on top of a Macintosh IIcx. Has 50 percent more display space than Apple's 13-inch color monitor. Board $1399; monitor $2800; bundled together $3699. SuperMac Technology, 408/245-2202.



16" Trinitron Display

2400/1200BPS Synchronous Modem

2400- and 1200-bps synchronous modem for the Macintosh Portable. Comes bundled with 3270 Doradus software to use remote communications applications such as field order entry, client-information searches, and E-mail. $1260. Doradus, 612/572-1000.

ColorGetter

Drum-based tabletop color scanner for professional graphic-arts use. Scans transparencies or photos ranging in size from 35mm to 10 square feet in one pass. Under $70,000. Optronics, 508/256-4511.



ColorGetter

Complete Fax Modem

9600-baud, send-and-receive internal fax machine and 2400-baud data modem for the Mac Portable. $599. Pinnacle Sales International, 408/559-8544.

Drawing Board 2300 Series

Large-format drawing tablets. User places a drawing or sketch on tablet and traces image to convert graphic information to digital information for entry into computer or CAD workstation. Supports Mac II and SE models. Active digitizing area comes in three sizes. 24-by-36-inch digitizing area $2295, 36-by-48-inch $2595, 44-by-60-inch $2995. CalComp, 714/821-2000, 800/225-2667.



Drawing Board 2300 Series

DT3600 Series of Digitizing Tablets

Digitizing tablet that performs with 508-dpi resolution. Comes with two-button stylus that has both ink and nonink cartridge. Can sample up to 200 characters per second. Built-in diagnostics automatically check all tablet functions at start-up. $449. Seiko Instruments, 408/922-5900, 800/888-0817.

hammer155FMFi

155MB internal hard disk with a 7ms average seek time, 2.2MB-per-second data-transfer rate, and a 50,000-hour mean-time-between-failure rating. Compatible with Mac II series. Comes bundled with installation software and FWB's Hard Disk DeadBolt, Hard Disk Partition, and Hard Disk Util software. $4095. FWB, 415/474-8055.



hammer155FMFi

hammerDisk1000

r1000MB rewritable optical drive with 35ms average seek time, 1.25MB-per-second data-transfer rate. Can store 500MB per side, uses ISO standard media, and is compatible with ANSI standard cartridges from Ricoh and Sony. $8995. FWB, 415/474-8055.

Laser 190A

9-pin dot matrix printer that is capable of print speeds up to 190 characters per second, has a graphics resolution of up to 136 dpi, is compatible with Adobe Type Manager, and comes with all cables necessary for operation. $349.95. Laser Computer, 708/540-8086, ext. 7111.



Laser 190A

LaserScript

300-dpi PostScript-compatible laser printer that is both Macintosh and PC-compatible. Supports all existing PostScript and HP LaserJet Series II applications. Comes with 35 Bitstream scalable outline fonts for PostScript emulation and 24 bitmapped fonts for HP

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LaserScript

emulation. $2995. Abaton, 415/683-2226.

LXPI Ram Upgrade

2MB RAM upgrade board for the Macintosh Portable. $1149. Pinnacle Sales International, 408/559-8544.

MacTrac/ADB

Trackball input device with three buttons that wrap around the ball, a sloped wrist-rest, and a 2¼-inch ball. Large buttons are above, beside, and below the ball and can be clicked by thumb or fingertips. Designed for easy use for both left- and right-handed people. $119. MicroSpeed, 415/490-1403.



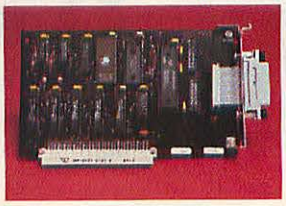
MacTrac/ADB

Maxima

Memory-extension product that enables you to use up to 14MB of internal SIMM or NuBus RAM as application memory. Provides this capability as a transparent software retrofit to existing operating system. RAM disk is automatically backed up in all cases of shutdown except for loss of power. Software only $129; $275 for Mac II model (includes a Mask 73 Motorola MC68851 PMMU). Connectix, 415/324-0727.

NBS-GPIB

NuBus IEEE-488 interface that enables the Mac II to function as an IEEE-488 instrument controller. Configuration can be selected and set with software.



NBS-GPIB

Comes with on-board RAM, software drivers, and sample application software on disk. $299. Fishcamp Engineering, 805/937-6758.

NewLife 33

Accelerator board for the Mac SE and SE/30 powered by a Motorola 68030 processor with 68882 floating-point math coprocessor operating at 33MHz. Ships with 64K of static RAM. $2995. Newbridge Microsystems, 613/836-1014.

OceColor PostScript Printer

Color PostScript printer that offers Pantone output. Prints Adobe PostScript images on paper or overhead transparency film. Uses a wax-based thermal process and produces a print resolution of 300 dpi. $10,990. Oce Graphics USA, 415/964-7900.



OceColor PostScript Printer

Proxima Data Display VersaColor

Full-color LCD projection panel that displays 512 colors. Enables you to project computer-generated images onto a screen via overhead projector. $6499. Proxima, 619/457-5500.

HP offers you the best things next

From input to output, Hewlett-Packard leads the way. With a full line of Mac-compatible printer and scanner choices.

For photographic-quality scanning, there's the HP ScanJet Plus scanner. Combine that with one of HP's high-quality printers. The DeskWriter, the new LaserJet III, the LaserJet IIP, or the LaserJet IID. HP even has color printers. The PaintJet and the PaintWriter XL.

Plus, HP stands behind all their products with exceptional service and support. And a one year warranty. It doesn't get much better than that.

There is a better way.



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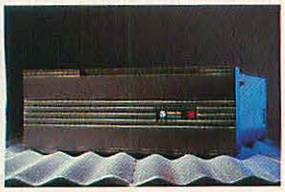
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Proxima Data Display VersaColor

RackMac 1200FX

Mac IIfx main logic board with Apple power supply, 4MB of RAM, and floppy disk drive. Comes in a steel enclosure with extra cooling fans and a removable, washable air filter. Unit has a front-panel key switch for on/off/reset and an O-ring seal to keep dust out of the floppy opening. Logic board is shock mounted to the case and the add-in boards are provided with shock-and-vibration retaining strap. $10,500. Greenspring Computers, 415/327-1200.



RackMac 1200FX

RasterOps Accelerator

24-bit color graphics board designed to work with display systems in 8-bit to 32-bit modes. Uses block-mode transfer to move data to display board at a rate of up to 36MB per second. Can also act as a bus master capable of accelerating all the display boards in Mac II series. $595. RasterOps, 408/562-4200.



RasterOps Accelerator

ScanMan Model 32

Hand-held scanner that includes a halftoning feature and 32-gray-scale editing, for use with a black-and-white monitor and ImageWriter or other non-PostScript printers. 1MB min. memory required for included software. $499. Logitech, 415/795-8500.



ScanMan Model 32

Video ColorBoard 364

NuBus board that integrates live 24-bit color video with Mac-created graphics. Has an external encoder that allows the output of 24-bit color images from the Mac screen as NTSC and S-video signals. $1995. RasterOps, 408/562-4200.

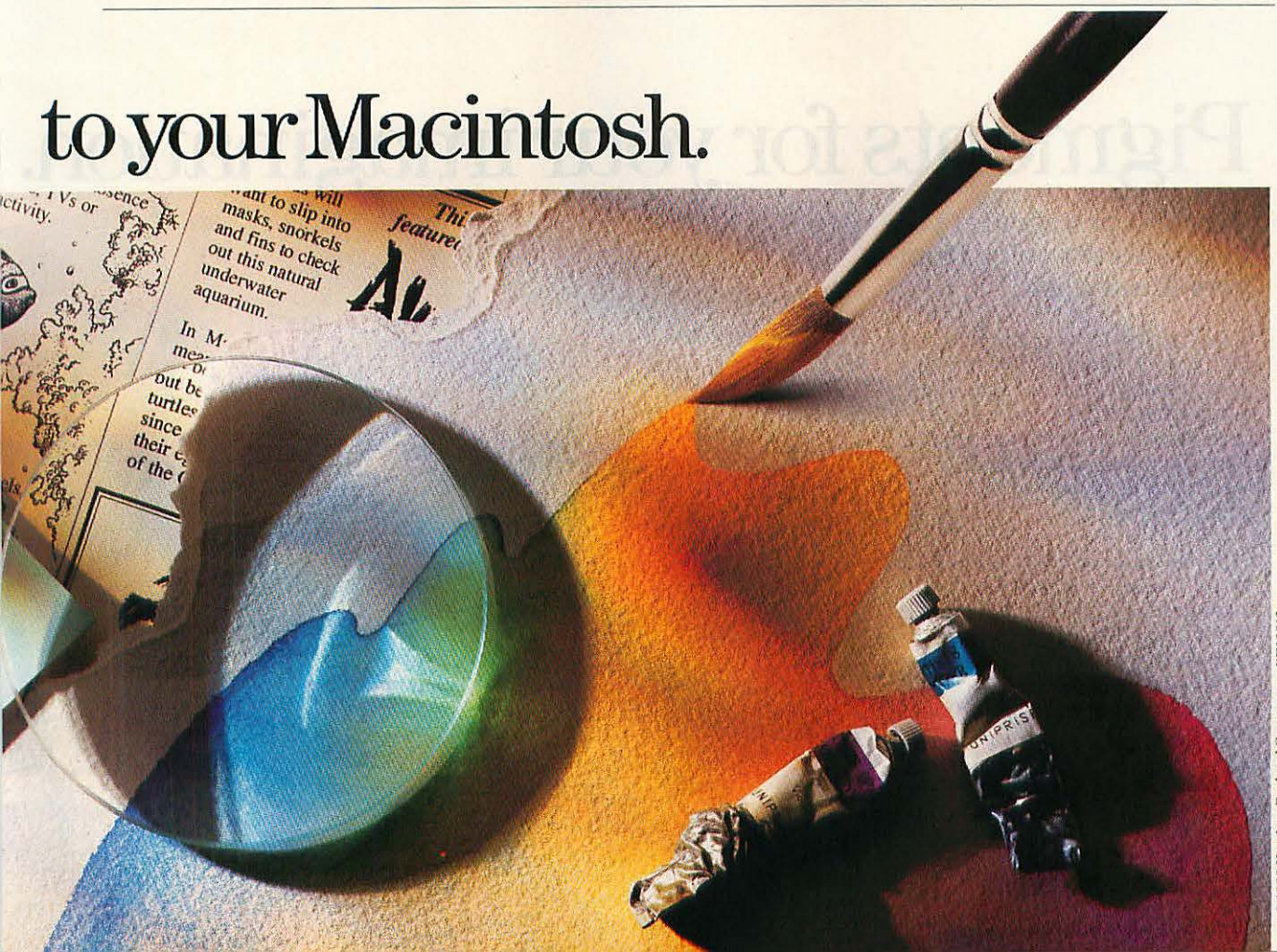
Video Encoder/Decoder

Video encoder/decoder box for use with video-graphics and frame-grabber boards that are not equipped with encoders or decoders. Stand-alone unit that accepts NTSC or PAL input and converts it to an RS-170 RGB or CCIR (50Hz) RGB output. Designed for *(continues)*



Video Encoder/Decoder

to your Macintosh.



© 1990 Hewlett-Packard Company PE12012

use by scientific and graphics professionals. $995. Data Translation, 508/481-8620.

Watchman II

Uninterruptible-power-supply system that supports the IBM PC and compatibles and the Mac. Has four outlets, and three ports for peripherals. Includes remote on/off control so computer can be turned on by phone call. Provides battery backup power for 10 to 30 minutes. Comes in three models: one for 350 watts of power ($825); one for 500w ($995); and one for 750w ($1225). Deltec, 619/291-4211.

SOFTWARE

4ThRight

Developer's workshop and library program; contains a user interface, application shell, and development library for creating Mac applications using ACIUS's programmable database, 4th Dimension. Has menu bars, button panels, and resources for constructing custom user interfaces. 2MB min. memory. Standard version $145; professional version $325. Digital Concepts, 503/244-4460.

Alarming Events

Appointment-and schedule-tracking DA. Users can select notification options: a pop-up dialog box, custom sounds, or flashing icon over Apple menu. 1MB min. memory. $129.95. CE Software, 515/224-1995.

BackMan

Multipurpose backup utility works as a general-purpose backup program. MultiFinder compatible. 1MB min. memory. $100. CTM Development, 415/573-8945.

Backmatic

INIT designed to automatically back up and archive files when the system is shut down. Can also be invoked manually. 512K min. memory. $99.95. Magic Software, 402/291-0670.

Clairvoyant

Utility that does repetitive typing tasks. Autolearn feature works in the background to record lengthy typed words and save them in a library for use with a word processing program, a text editor, a programming language, or the Finder. 1MB min. memory. $99. Tactic, 305/378-4110.

Copernicus

Software that consists of a set of programs that enables you to communicate with any bulletin board system that uses the Fidonet protocol. Acts as an off-line reader, enables the user to receive and transmit files. Provides a standard interface whether or not the bulletin board system being accessed is Macintosh or IBM-compatible based. 1MB min. memory. $39.95. Software Design, 515/279-9650.

CommGate

Gateway that runs on a Microsoft Mail server. Provides all authorized users on Mac or MS-DOS workstations access to MCI Mail services. 2MB min. memory. $595. Solutions, 802/865-9220.

Control II

Database system developed in 4th Dimension that is designed for use in manufacturing. Features record keeping for current customers and prospective customers, order and invoice filing structure that provides for multiple price

Pigments for your imagination.

HP color printers let you draw splashy color from your Macintosh.

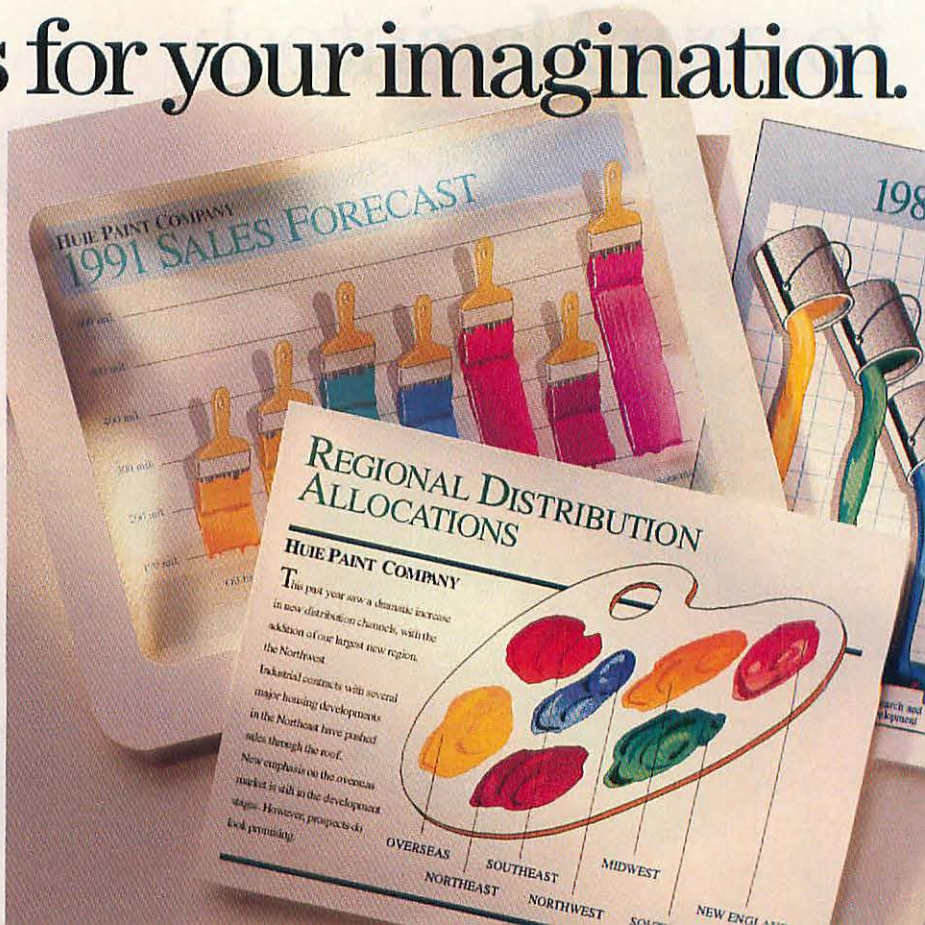
Entertain your thoughts with HP's PaintJet and PaintWriter XL color printers. Both are fully Mac-compatible and let you use all Quickdraw-based software applications. That means high-quality Macintosh II output in 16.7 million colors.

Print on paper or transparencies with 13 scalable outline fonts. And for shared use, the PaintWriter XL offers AppleTalk, faster speed, and auto sheet feed. For sample output and the name of your authorized HP dealer, call **1-800-752-0900, Ext. 1167.**

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levels and bulk-order price breaks, tracking for individual back-order status, and automatic posting of invoices to orders. 1MB min. memory. $1495. Diamante Software, 214/341-6711.

Cudgel

Litigation-management software helps attorneys to coordinate evidence, witnesses, facts, laws, papers, notes, docket due dates, costs, and other information pertinent to a trial from complaint through discovery to trial and appeal. Requires Odesta's Double Helix II. 1MB min. memory. $650. Greenlight Software, 312/782-6496.

Descartes

Mapping software for businesses that integrates a built-in database with depictions of data according to geographic location. Designed for use in identifying target markets, aligning sales territories, adjusting prices and premiums, marketing, sales, and advertising. Requires hard disk. 2MB min. memory. $995. Intermap, 603/795-4751.



Descartes

Ethical Dilemmas in Environmental Stewardship

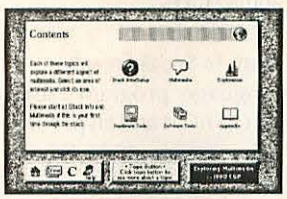
Interactive instructional program that is designed to examine the ecological, social, and cultural ramifications of some fundamental environmental-management issues, and to explore the manner in which a stewardship ethic may be manifested in daily practice. 2MB min. memory. Department of Landscape Architecture, Ohio State University, 614/292-8263.

Eureka Labels

Kit containing 216 labels preprinted with the names of external connections, cables, hardware items, ports, and peripherals. $8.95. AMT Communications, 213/320-7757.

Exploring Multimedia

HyperCard stack designed to introduce users to desktop multimedia. Can be used as a companion to the book *Multimedia Is for Everyone* (Cheshire Grin, 1989). Stack includes a collection of sounds, animated icons, and interactive techniques and can be navigated in a variety of ways. 1MB min. memory. $99. Cheshire Grin Productions, 416/896-8077.



Exploring Multimedia

FrameMaker 2.0

Mac publishing package that's compatible with native window environments for Sun and Next machines. Includes tools for word processing, graphics, page layout, equations editing, and book building. 2MB min. memory. $995. Frame Technology, 408/433-3311.

HandOff II

Software that launches applications and opens documents from a user-configurable pop-up menu. Users can assign files to applications by creator, file-name extension, or file type. Auto-

(continues)



matically sets color depth and sound level to suit the applications being launched. 1MB min. memory. $79.95. Software Innovations, 214/727-2329.

Inside

HyperCard XCMD tool that increases HyperCard developer's ability to manipulate all objects in a stack. Enables developer to select multiple objects and move them; align them; change the text height, size, font, style, or alignment; and rename or resize them. 1MB min. memory. $99. Analytx, 303/530-5126.

Inside Information

Hierarchical dictionary that organizes the English language into categories of defined words. Contains seven general word classes: Nature, Science and Technology, Domestic Life, Institutions, Arts and Entertainment, Language, and The Human Condition. 1MB min. memory. $119. Microlytics, 716/248-9150.

Katie's Farm

Software for children in which a character called McGee visits his cousin on Katie's farm. In the chicken coop, Katie feeds the chickens and gathers eggs. Aunt Thelma milks the cow in the barn, and the children go fishing at the pond. Animated sequences are accompanied by digitized sound. 1MB min. memory. $39.95. Lawrence Productions, 616/665-7075, 800/421-4157.

Learn To Speak French

Language program based on CD ROM and HyperCard that consists of 35 French lessons and contains interactive drills to help user master French grammar. Includes communication drills that can be used as they are or modified. 1MB min. memory. $249.95. The HyperGlot Software Company, 615/558-8270.

LexaFile

A set of HyperCard stacks for managing legal information. Designed to help attorneys retrieve client records, case and matter files, and court dates. Uses automatic routines—for example it dials the telephone and calculates filing dates. Records are dynamically linked. 1MB min. memory. Single copy $300; volume discounts and site licenses are available. Xram Xpert Systems, 212/989-8356.

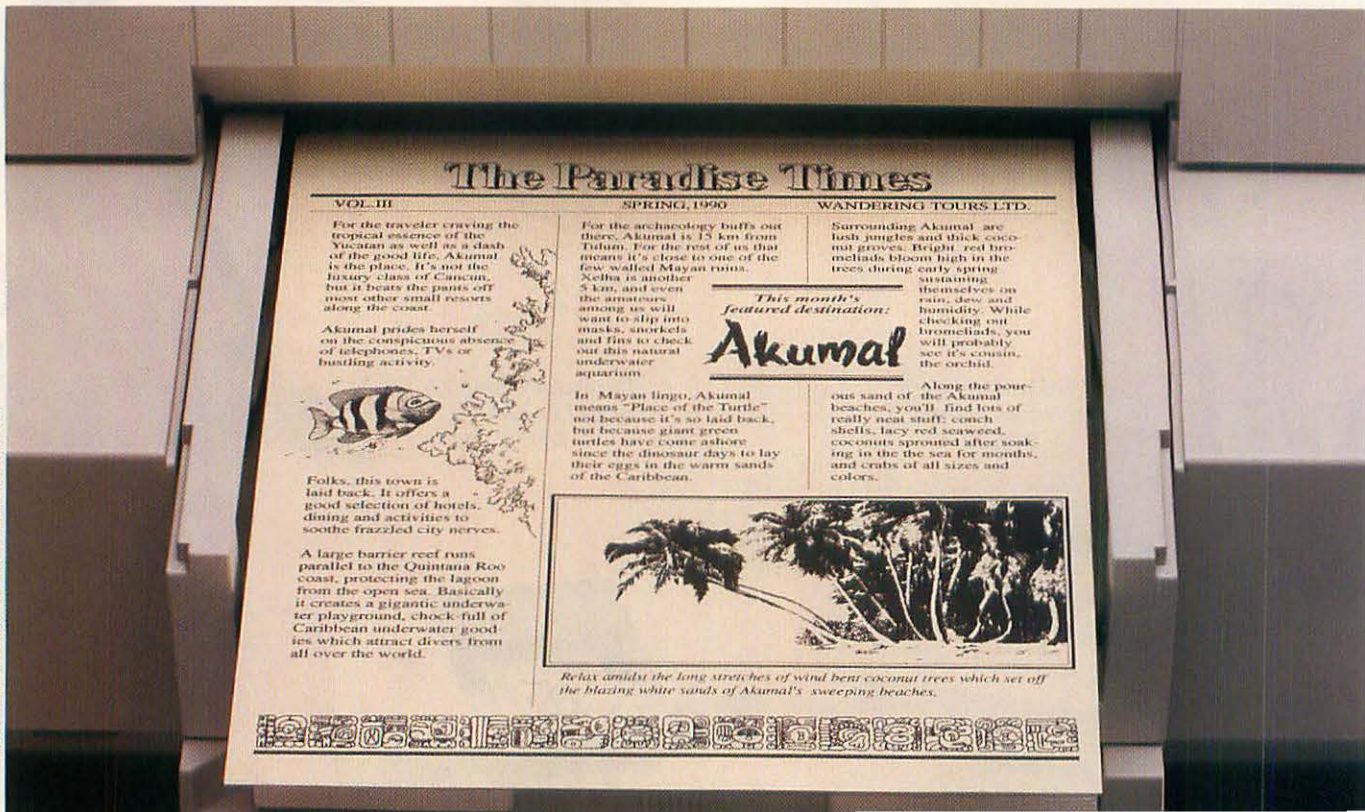
Lotus MarketPlace

Marketing software to help business people perform sales prospecting and market analysis. Combines CD ROM databases of names, addresses, and marketing data on U.S. businesses and households with software for targeting customers, analyzing markets, and creating lists. Data is updated quarterly. 4MB min. memory. $695. Lotus Development, 617/577-8500.

MacBack

Backup and restore software that performs system backup by file, folder, volume, or application. Performs full and incremental backups. Screens allow user to designate where to send backup data and use calendars to determine when the backup should start. Auto-Start feature assures that each backup occurs automatically. 1MB min. memory. $99. Advanced Digital Information, 206/881-8004, 800/336-1233.

With the HP DeskWriter, you can



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Documents created using Microsoft® Word and Aldus PageMaker®
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PageMaker is a U.S. registered trademark of Aldus Corporation.

MacCorrector

Correction and language-translation module that replaces the standard dictionary supplied with most published Mac software; can be used with software that offers no dictionary. Available in English and German. 512K min. memory. $495 with English dictionary; $165 additional for German dictionary. TechWare Computer GmbH, Blumenstraße, D-5400 Koblenz, West Germany.

MacDine

A program that analyzes the nutrients in foods and compares them with established national guidelines. Score shows how well or how poorly the user eats. Includes a 238-page book to help improve eating habits and to learn about relationships between nutrition, illness, and food choices. 1MB min. memory. $199 plus $5 s/h. Dine Systems, 716/688-2492.

MacFortran II

FORTRAN Compiler designed for Apple SE/30 and Mac II series platforms. Runs under MPW and includes Absoft's MRWE (MacFortran Runtime Window Environment) library. MRWE can automatically add an extendable user-definable Mac interface to any FORTRAN program compiled with MacFortran II. 2MB min. memory. $595. Absoft, 313/853-0050.

MacInspect

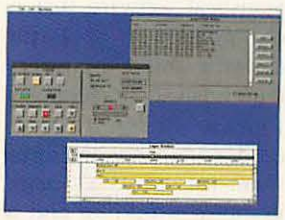
Inspection software for manufacturing. Covers all aspects of the manufacturing process: sampling schemes, dispositions, vendor notification. Based on the U.S. military standard 105D. Generates reports and graphs for use in analyzing data in the user-definable parts-attribute database. 2MB min. memory. single user $469; $125 per additional user. R. D. Fritz, 704/652-7168.

MacOrg

Organizational-chart–drawing program that automatically saves changes. Also lets user select any font in System Folder and exports to major word processing packages. Enables the user to draw organizational charts as large as nine boxes across and nine boxes deep. 512K min. memory. $109. The Claybrook Company, 214/341-9438.

MacVac-S

Software package for video tape recorders that have built-in SMPTE time code (used for putting an individual label on each frame) and are serial controllable. Uses the Mac's RS-422 port. 2MB min. memory. $1495. Advanced Digital Imaging, 714/725-0154.



MacVac-S

MasterTuner

Software that is designed to help tune acoustic musical instruments. Uses Farallon's MacRecorder to record sounds from a musical instrument being played—and displays a tuning graph for a particular note. Also plays reference tones using sampled sounds; comes with sounds for several

(continues)

have it all. (But keep it to yourself.)



The HP DeskWriter printer puts laser-quality printing right at your fingertips.

With a small size and a $1,195* price tag, the DeskWriter printer easily fits on your desk and in your budget. And its advanced 300 dpi inkjet technology lets you print sparkling text and detailed graphics.

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instruments. 1MB min. memory. $99.95. Andromeda Computer Systems, 403/247-5300.

Minitab Statistical Software

Statistical software that is equipped with tools for carrying out exploratory data analysis, including a Journal window that records commands and saves them for use as a macro, graphics windows, and a log window for scrolling through output. 1MB min. memory. $695. Minitab, 814/238-3280.

NetCounter

Laser-printer utility for use on networked printers. Generates a variety of accounting information for individual workstations on a network. Provides an option for resetting the page count for new workstations as they are added. 1MB min. memory. $59.95. Prism, 301/604-6611.

Norton Utilities for the Macintosh

Utilities package that is designed to automatically diagnose and repair a wide variety of disk errors on the Macintosh. Has 45 different types of error checks, provides easily comprehended descriptions of problems, and recommends whether to fix or skip the problem. 1MB min. memory. $129. Peter Norton Computing, 213/319-2000.

pcMacterm II and pc Macterm II/Network

Mac-to–IBM PC bidirectional file-transfer and remote-control programs designed with proprietary file-transfer protocol. Works over modem or serial cable connections and transfers data files between Macintoshes and PCs in local environments or long distance over telephone lines. 1MB min. memory. pcMacterm II $195; pcMacterm II/Network $395. DMA, 516/462-6652.

PM Tracker

Tracking and kerning utility for use with PageMaker 4.0 that lets the user click on any of the customized tracks to tighten or loosen the character spacing based on the size of type being used. Tracking can be calculated to 1/10 of 1 percent and kerning can be adjusted to up to 1/2000 unit per em. 1MB min. memory. $99. EDCO Services, 813/962-7800, 800/541-2255.

PrintBar PostNet

Volume of postal bar-code fonts. Supports all Macintosh-compatible printers. 512K min. memory. $225. Bear Rock Technologies, 916/622-4640.

Project Scheduler 4

Project-scheduling software for the Macintosh that allows the user to load multiple projects into memory simultaneously, while displaying the resource utilization for each one. Program automatically accounts for resource-cost inflation and provides interactive and automatic resource leveling. 1MB min. memory. $685. Scitor, 415/570-7700.

Publish by Design

Computer-based training program and reference tool for users of Macintosh desktop publishing software. Provides tips and techniques and acts as an online reference for users of software such as Aldus PageMaker and a number

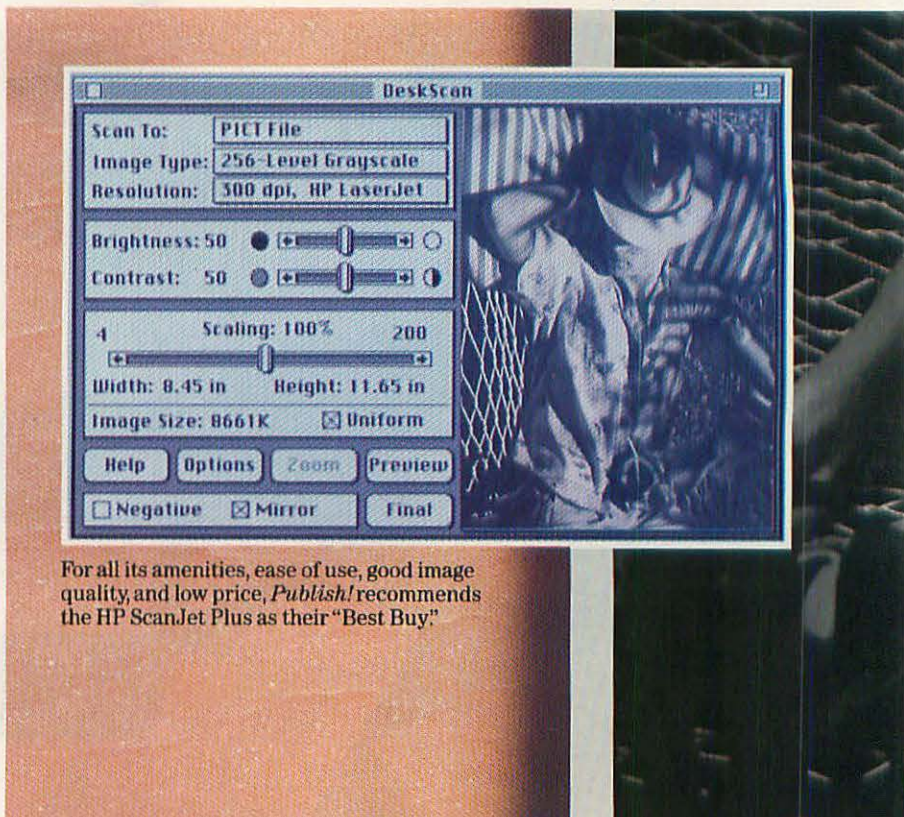
With the HP ScanJet Plus, you've

The HP ScanJet Plus scanner provides 8-bit photographic-quality scanning.

That means 256 shades of gray for the hottest-looking output from your Mac. And it's so easy, too. At the click of a mouse, you can get negative or mirror images, as well as scaling in 1% increments from 4-200%. All for $2,190,* about what you would expect to pay for a 4-bit scanner.

So if you want the richest, most detailed images from your Mac, you've got it made with Hewlett-Packard. Call **1-800-752-0900, Ext. 1005** for your authorized HP dealer.

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For all its amenities, ease of use, good image quality, and low price, *Publish!* recommends the HP ScanJet Plus as their "Best Buy."

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of word processors. 1MB min. memory. At least 2MB hard disk space required. $149.95. Online Computer Systems, 301/428-3700.

Publish-It Easy

Desktop publishing program with page-layout, word processing, and built-in drawing and painting capabilities. User interface designed for novices in the desktop publishing field. 512KE min. memory. $199.95. Timeworks, 312/948-9200, 800/535-9497.

Raster Graphics Libraries

Collection of three raster graphics libraries that support standard image-compression and image-storage schemes that are designed to shorten the development time required by application programmers. g3lib performs CCITT Group 3 one-dimensional and modified huffman compression and decompression. g4lib performs CCITT Group 4 compression and decompression, and tifflib provides access to tagged image file format files. 1MB min. memory. $125 each library. Mystic River Software, 617/391-4936.

Screen Locker

Screen-protection software that locks the display so that it can be viewed only using a password. Password and Backdoor Keys are hidden and encrypted to prevent intruders from discovering them. 1MB min. memory. $79. Now Software, 503/274-2800.

Send Express

DA that sends files and Clipboard selections directly between Macs connected to an AppleTalk network. Designed for people working on the same project but with separate Macs. 1MB min. memory. Five-user pack $179. Gizmo Technologies, 415/623-7899.

SnapApp

Software designed to help novice and intermediate developers write applications in FoxBase+/Mac. Uses a standardized approach to producing applications with windows, pull-down menus, and online help program. Comes with user's guide that describes each procedure. 1MB min. memory. $44.95. Plaid Software Group, 501/375-6622, 800/776-0739.

Spot On

Disk-caching software that reduces disk access time by at least 50 percent. Has a feature for historical caching and uses direct SANE routines for increased caching speed. Supports most hard disks. 1MB min. memory. $99.95. Workstation, 512/327-3211.

SQLTime

Set of external functions that allow users of RagTime 3 to have direct access to SQL databases such as Ingres, Oracle, Rdb, Sybase, and others. Compatible with two different protocols for communication between a host computer and a Mac. 2MB min. memory. RagTime, 415/780-1800.

StatusMac

Network-management software that monitors status of individual computers on AppleTalk-compatible networks. Monitors status of attributes such as RAM size, system configuration, connected peripheral devices, CPU information, and Sys-

(continues)

got it made in the shades.

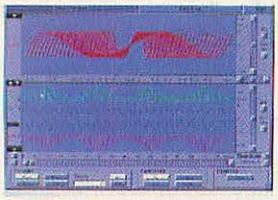


*Suggested U.S. list price. © 1990 Hewlett-Packard Company PE12004

tem-file information. Monitoring can be requested by network manager but is also within the user's control. Basic package limited to ten user profiles. 1MB min. memory. Basic package $799; $60 per additional user profile. Pharos Technologies, 513/984-9273.

SuperScope

Data-acquisition, -analysis, -presentation, and -management software that provides real-time oscilloscope, *xy* recorder, strip-chart recorder, and spectrum-analysis capabilities. 1MB min. memory. $990. GW Instruments, 617/625-4096.



SuperScope

SwivelArt: 3D Images for the Macintosh

Collection of 3-D graphic elements divided into four categories: images of Mac models and general office equipment; ten fonts that include punctuation and numbers; icons of natural resources and types of industry; and presentation elements that consist of maps and various graph and chart items. 1MB min. memory. $129.95. Paracomp, 415/956-4091.



SwivelArt: 3D Images for the Macintosh

Trick or Treat

Math game that centers around a Halloween theme. Objective is to collect as much candy as possible by answering problems correctly. Has addition, subtraction, multiplication, and division problems; incorporates graphics and sounds. Designed for children in kindergarten through fourth grade. Built-in timer can be set for various levels of difficulty. 1MB min. memory. $39.95. BES Software, 913/478-4243.



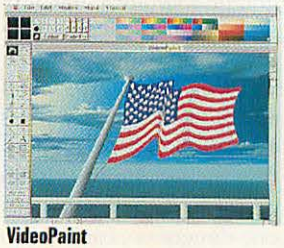
Trick or Treat

T-Script

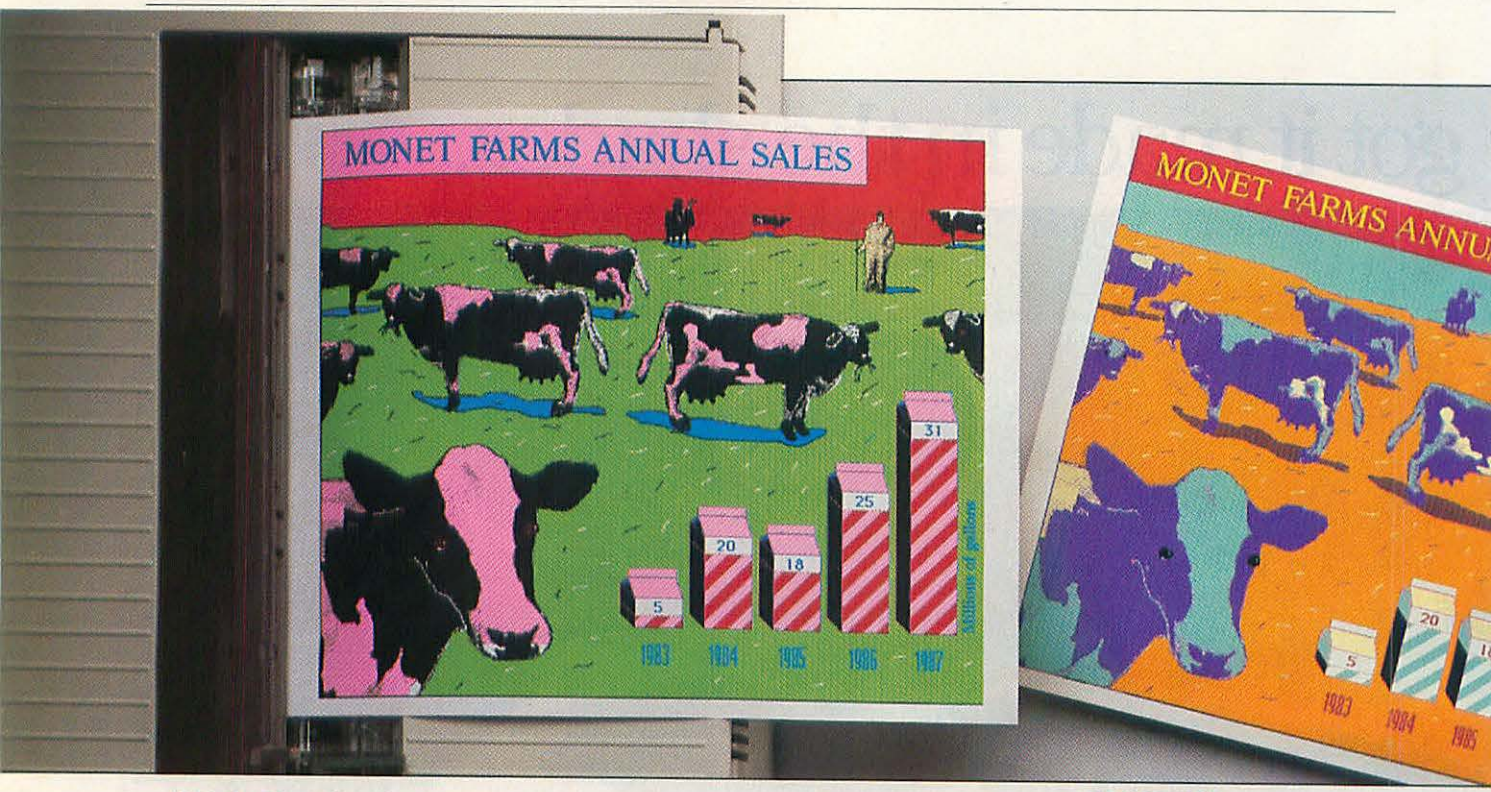
A raster-image processor that is able to interpret PostScript and drive a variety of non-PostScript printers. Interprets PostScript directly and supports Adobe Illustrator, Aldus FreeHand, Aldus PageMaker, QuarkXPress, ReadySetGo, Canvas, Microsoft Word, Microsoft Works, MacWrite, and MacDraw. 1MB min. memory. $145. TeleTypesetting, 617/634-9700.

VideoPaint

8-bit color paint and editing program that incorporates special effects such as spherization, blur, smudge, and diffuse, and an open architecture that lets developers write new special effects and write their own input and output drivers us-



VideoPaint



With the PaintJet color printer from Hewlett-Packard.

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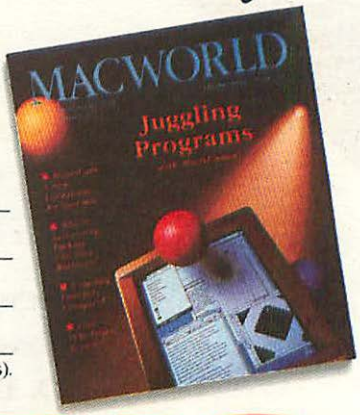
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MACWORLD

The Macintosh® Magazine

ing Pascal, C, or assembly language. 2MB min. memory. $199 plus $6 s/h. Olduvai, 305/665-4665.

Writer's Helper 3.0

Software that is designed to assist writers with writing preparation, drafting, and revising. Includes 19 writing-preparation activities to help students find, explore, and organize information about a subject. Provides 18 revising tools that guide students through the process of finding structural problems and grammatical errors in their writing. 512K min. memory. $120. Conduit, 319/335-4100.

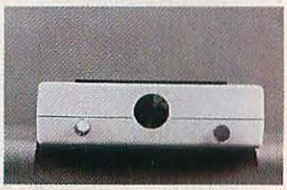
ACCESSORIES

Carpal Lock

Semirigid brace that covers hand and wrist for computer-keyboard users. Device allows for maximum use of fingers and thumb while preventing flexion, hyperextension, and ulnar deviation that contribute to carpal tunnel syndrome. Available in various sizes, from extra small through large. $28.50. Direct Safety, 602/968-7009.

ELF

Electronic unit that sits on top of any computer monitor. Generates a buffer wall of air rich in negative ions, which is designed to counteract the positive ions produced by CRT units. The wall of air includes a small level of ozone, which is there to oxidize the phenol outgases that are believed to be produced by the plastic casings of computer hardware. Unit produces air movement without a fan. $79.95. Zenion Industries, 707/584-3663, 800/477-5297.



ELF

PolyWrist-Wrest

Wrist rest that attaches to the edge of a desk in front of the computer keyboard. Designed to cushion the user's wrists and help keep them in a straight position while working at a keyboard. $5.95. The PolyWrist-Wrest Company, 206/454-6230.



PolyWrist-Wrest

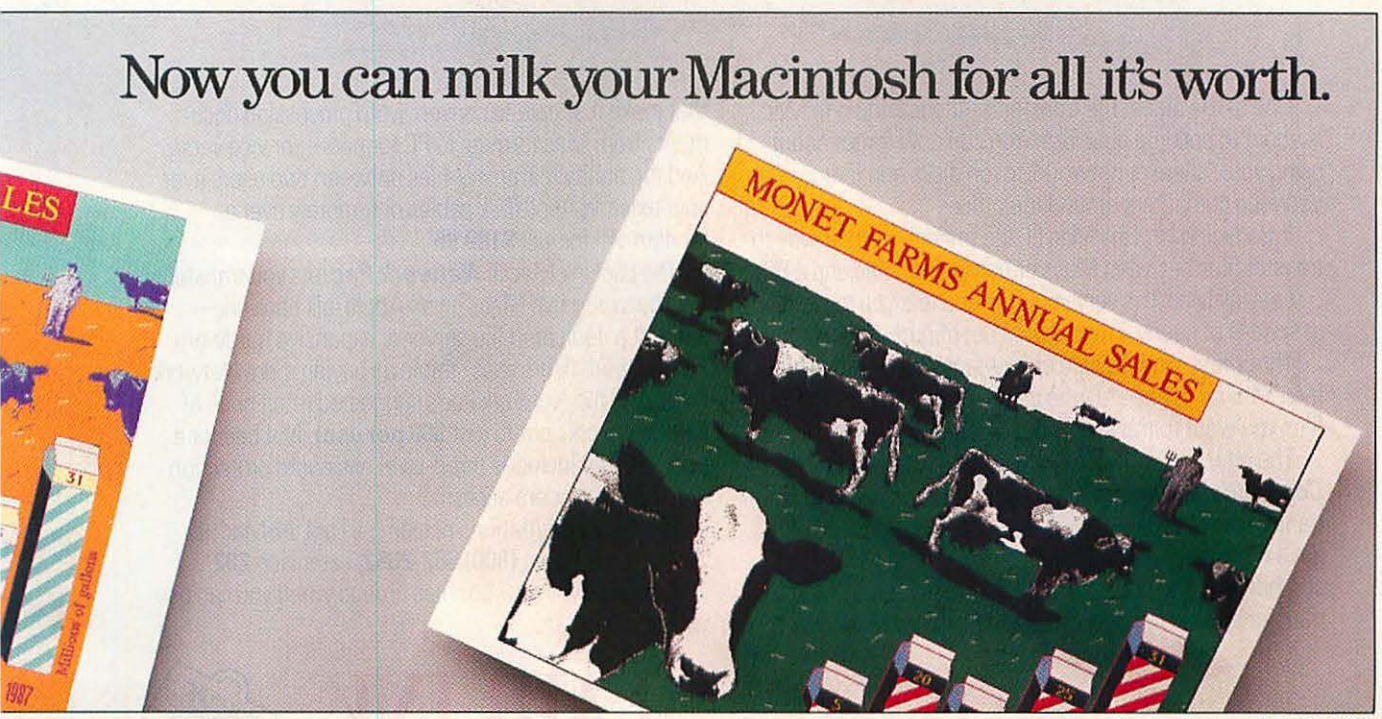
BOOKS & VIDEOS

Real World PageMaker 4

PageMaker book for professionals. Covers PageMaker 4.0 for the Mac with tips and techniques using the systems' tools. Describes color techniques and PageMaker's color models. Coauthored by Olav Martin Kvern and Stephen Roth. $24.95. Bantam Electronic Publishing, 212/765-6500. M

To have your product considered for inclusion in *New Products*, send an announcement with product name, description, minimum memory, peripherals required, pricing, company name, and phone number (and two copies of software) to New Products Editor, *Macworld*, 501 Second St., San Francisco, CA 94107. We reserve the right to edit submissions.

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much to your work: 256 colors for the Macintosh II and 8 colors for the Macintosh SE. For just $1,395. Plus $125 for an interface kit that connects cleanly and simply.

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One of the oldest file transfer methods known to Mac is about to become obsolete. You can now forget about using your "sneaker network" to run disks and files between computers around the office.

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The LapLink Mac III ***Network Pac*** lets you transfer files between five Macs on an AppleTalk network—without a dedicated file server or expensive hardware. Adding more users is as simple as buying more Network Pacs. And the Network Pac's suggested retail price of **$299.95*** works out to just **$60 per user**. Not bad for a package that includes three-level password protection and remote modem access.

For more information, including a LapLink Mac III brochure, call us at **(800) 662-2652**, extension **202**.

After all, why run your files around when you can use your computer?

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***Manufacturer's suggested retail price**

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Quick Tips

EXCEEDING MAC PLUS AND SE MEMORY CONSTRAINTS, REVISING EPS GRAPHICS, TYPING WITH THE MOUSE, AND MORE

BY LON POOLE

Back in October, a reader pointed out that pressing Option-⌘-E dismounts disks (ejects and removes them from the desktop) in the Finder. After experimenting awhile, Paul Williamson of Harlingen, Texas, discovered that a similar technique also works in Open, Save, and other standard directory dialog boxes. Just press the Option key while clicking the Eject button. Be sure to hold down the Option key for a few seconds after the disk ejects, or the disk's icon may not be removed from the desktop. Dismounting disks not only reduces desktop clutter when using MultiFinder, it also prevents the annoying alert "Please insert the disk: [disk name]."

Simple Envelope Addressing

Using MacroMaker to address an envelope as suggested in May's *Quick Tips* seemed too slow to Monte Wasch of New York City. He came up with the following method: use Microsoft Word's Define Styles command (Format menu) to create a style called Envelope. It's the same as Normal style except the left indent is set at 3 inches. Before dismissing the Define Styles dialog box, add the Envelope style to Word's Work menu by pressing ⌘-Shift-+ and clicking on the Envelope style name. After writing and printing a letter, select the name and address at the top of the letter and choose Envelope from the Work menu. If the address contains a long line that wraps around, either move the right indent marker in the formatting ruler for that line or type a Tab at the beginning of the continuation part of the line. Then, with the entire name and address selected, choose Print from the File menu, set the Print Selection Only option, click OK, and insert an envelope in the printer.

This method works fine as long as the top margin of the letter is the same as the top margin of an envelope (1½ to 2 inches), the first page of the letter has no header, and you don't want to print a return address on the envelope.

Quicker Page Change

A tip from Rick Archer in April's *Quick Tips* suggested choosing the Fit In Window view before changing pages in PageMaker—to reduce the scrolling necessary when you return to that page later on. A much quicker method, suggested by Paul Davis of Tujunga, California, is to press the Shift key whenever you change pages. The page appears in the Fit In Window view no matter which view was last used for the page. Habitually changing pages in this manner can save quite a bit of time, especially if you're using Adobe Type Manager (ATM). On a small screen, most of the type on a typical page is greeked in the Fit In Window view, relieving ATM from rebuilding the screen fonts.

Cancel Bidirectional Printing

Q April's *Quick Tips* mentions making the ImageWriter print bidirectionally in Faster quality by pressing the ⌘, Shift, and Option keys while clicking OK in the Print dialog box. I tried this and it does reduce printing time, but it also degrades appearance, just as you said it would. However, now the ImageWriter always prints bidirectionally in Faster quality. Do you know if there is any way to get back the better-looking unidirectional Faster quality?

Dave Madsen
Sioux City, Iowa



A Yes, by replacing the ImageWriter file in your System Folder with a fresh copy from the Printing Tools disk (or System Tools disk) that came with the most recent system software upgrade. You can get the latest system software from an Apple dealer and from many user groups.

RAM Barrier

Q I polled several of the advertisers listed in the back of *Macworld* about upgrading the RAM in a Mac Plus to 8 megabytes using two 4MB SIMMs. Their responses varied:

(continues)

Macintosh TO UNISYS MAINFRAME CONNECTIVITY



The Personal Emulation Package (PEP™) allows a Macintosh to emulate the entire family of UNISYS (Sperry) terminals (UVT112X and UTS 20, 30, and 40) for connectivity to Series 1100/2200 and System 80 mainframes. PEP features multi-session support, integrated printing, line monitor to disk, cut & paste, macro-key programming and a fully dynamic configuration. PEP supports both synchronous and asynchronous communication via multiplexers or modems.

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1. You can't do that.
2. Sure, it'll work.
3. You might be able to get them in, but the Plus won't know most of the memory is there.

What is the correct answer?
Charles R. Smith
Erial, New Jersey

A I put your question to Steve Sawyer, the managing partner at CJS Systems (415/849-3730), which has done Mac upgrades and repairs for years. He said installing more than 4MB of RAM in a Mac Plus or an SE would be pointless because the 68000 CPU (central processing unit) used in those machines can access only 4MB of contiguous RAM. Instead, consider upgrading with an accelerator board that has either a 68020 CPU and a 68851 PMMU (Paged Memory Management Unit) or else a 68030 CPU with its built-in PMMU. For information on specific upgrade products, see "Is Your Mac Obsolete?" (February 1990).

Those accelerator boards speed up a Mac Plus or SE considerably. They also let you install virtual-memory software to double or triple available memory without adding more SIMMs. Virtual-memory software uses hard disk space to increase the memory available. A system with virtual memory typically performs 80 to 85 percent as fast as a system with 100 percent SIMM memory. However, most people find virtual memory unsatisfactory for viewing animation or listening to digitized music on a Mac. The virtual-memory software Virtual is available now from Connectix (415/324-0727). Also, Apple has announced that System 7.0—which should be available later this year—will include virtual memory.

Typewriter as Printer

Q When I started computing with an Apple II a few years ago, I was able to use an electronic typewriter as a serial printer. Is there any way to use a typewriter as a serial printer with a Mac IIcx, Microsoft Word 4.0, and Microsoft Works?

Mel Rodnon
Fresh Meadows, New York

A Two utilities let you use the Mac with a multitude of electronic type-

writers, non-Apple dot matrix printers, and daisy wheel printers: Mac Daisy Link, from GDT Softworks (604/291-9121), and Printworks For The Mac, from Phoenix Technologies Ltd., 808/396-6368). To find out if either product supports your typewriter, contact the software publisher directly.

Revising EPS Graphics

TIP: I've discovered a technique for revising an EPS graphic that has been placed in PageMaker 3.02. You don't need the original graphic even if the graphic has been cropped or resized in PageMaker. In most cases you can edit type in the graphic even if you don't have the font. You first export the graphic using PageMaker's Print command, then revise the exported graphic using Illustrator 88, and place the revised graphic back in PageMaker. Follow these steps.

1. Open the PageMaker document and copy the EPS graphic you wish to change.

2. Close the PageMaker document and paste the EPS graphic into a new, empty PageMaker document. You don't need to save this document.

3. Choose Print from the File menu. If the Print dialog box has an Options button, click it. Otherwise, press the Option key while clicking the OK button. Either way, a PostScript Print Options dialog appears (see "EPS Exporter").

4. Select the Print PostScript to Disk and EPS options. Click the Set File Name button, and in the directory dialog that appears, decide where you want to save the exported EPS graphic and what you want to name it. If the graphic contains only fonts that are built into your printer (Times, Helvetica, and so on), then deselect the Download PostScript Fonts box. Deselecting that option reduces the size of the EPS file by eliminating font descriptions from it.

5. If the PostScript Print Options dialog box has a Print button, click it. Otherwise click its OK button and then click the Print dialog box's OK button. PageMaker saves a PostScript file to disk, giving it the name you specified.

6. Switch to Illustrator. Use Illustrator's Open command (File menu) to open the PostScript file just saved by PageMaker's Print command. The exported graphic appears, ungrouped and ready for revising. Any stretching or cropping that was done in PageMaker is not present in this graphic.

7. After revising the graphic, use the Save As command to save it in a new file. Be sure to select the Macintosh Preview option when you save.

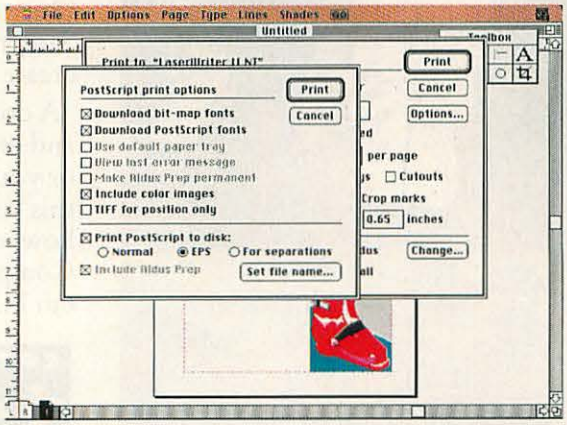
8. Open the PageMaker document that contains the old graphic, select that graphic and use the Place command (File menu) to put the revised graphic in its place. If you select the Place command's Replace Entire Graphic option, PageMaker scales and crops the revised graphic just like the old one. (If you resized the graphic using Illustrator, PageMaker resizes it so that at least one side of it fits the space of the old graphic.)

Anne-Marie Concepcion
Chicago, Illinois

Keyboard Help

TIP: If you type characters that require pressing arcane key combinations and you're tired of using Key Caps as a memory aid, you should have the INIT (start-up document) PopChar in your System Folder. When you press the mouse button with the pointer in

(continues)



EPS Exporter

Use PageMaker's PostScript Print Options to export an EPS graphic for revision in Illustrator 88.

Introducing: the MousePen Pad*



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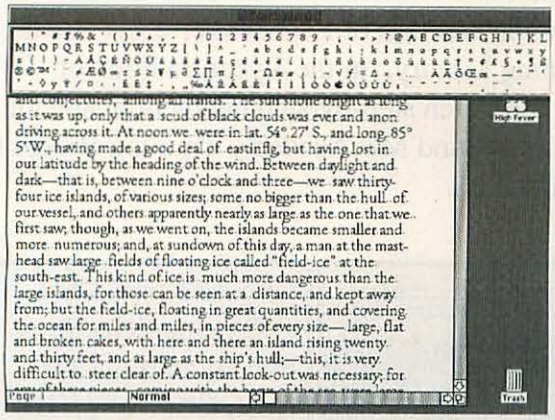
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the upper-left corner of the screen, PopChar displays a window showing all available characters (see "Type Cast"). You "type" any one of these characters by dragging the pointer to it and releasing the mouse button. PopChar 1.0 may have trouble determining the current font in an application that has no font menu. Also, it doesn't work well with multiple monitors. PopChar was created by Günther Blaschek and is free (excluding distribution costs) from many user groups and online information services.

Craig Robinson
Kansas City, Kansas

Move Tabs Together

TIP: In Microsoft Word, you can move a number of tab markers simultaneously without changing the relative spacing between them. Simply press the Shift key while dragging the leftmost of the tab markers you want to move as a body.

Shamas Nanji
Montreal, Canada

Optional XPress Views

TIP: When working on a QuarkXPress document, you may sometimes find that the Actual Size view is too small and the 200% view is just too large. Press the Option key before pulling down the View menu and hold it down while choosing 75%. You'll magnify the view to 150%. Likewise, pressing Option while choosing 200% yields 400%. (This Option-key technique doubles the other view sizes too, but only 75% and 200% create new sizes that aren't available on the menu.) To learn how to switch to the Fit In Window, Actual Size, and 200% views without using the View menu, read about the View command in the QuarkXPress reference manual

Terry Wilson
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Disk Saver

TIP: When you're mailing a floppy disk in a letter envelope, make sure the disk's sliding metal door is at the bottom of the envelope. This will keep the postage canceling machine from hitting (and crushing) the metal door.

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Blemish Cover-up

TIP: To remove a small dot or line from an imported graphic in a PageMaker document or in the draw layer of Microsoft Works, use Works' or PageMaker's drawing tools to draw a square, a circle, or another shape. Then set the shape's fill and line color to white. You can drag this patch anywhere on the page and resize it to cover mistakes in an imported graphic.

Edna E. Padin
Buffalo, New York

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Lon Poole answers readers' questions and selects their tips for this monthly column. He has written many personal computer books, including the quick reference HyperTalk *(Microsoft Press, 1988), and a new book of Mac tips (to be published soon by Microsoft Press),* Amazing Mac Facts.

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Getting Started with MIDI

How to use your Mac to control musical instruments, audio equipment, and even the lights

BY JIM HEID

In 1982 the largest companies in the electronic music industry overcame their normally secretive and competitive urges and agreed to cooperate. The result of their collaboration was not a hot new musical instrument, but a 13-page document that has literally changed the way the world makes music.

That document described the Musical Instrument Digital Interface, or MIDI. MIDI was developed to enable musicians to connect electronic instruments to each other and to computers. The MIDI specification spells out the types of wires and connectors that unite musical instruments, as well as the commands and codes that MIDI-equipped instruments transmit and respond to. Generally, any piece of equipment with MIDI—whether a musical instrument or a computer—can talk with any other piece of MIDI gear.

On a basic level, MIDI lets you create a network of two or more instruments that you can play from just one instrument. Musicians often use this technique, called *layering*, to play multiple instruments simultaneously to obtain a richer sound. On a somewhat more advanced level, MIDI lets you connect one or more instruments to a computer to record and play back music and add accompaniments. This aspect of MIDI has helped create a new phenomenon—the home recording studio. And at its most advanced level, MIDI lets you combine a computer-controlled network of instruments with audio equipment and even stage lighting to automate an entire performance environment.

With its appealing graphics and easy operating style, the Macintosh has become a popular computer among musicians. And fortunately, most MIDI applications do not require a top-of-the-line computing setup. A Mac Plus can handle most basic MIDI tasks as well as the high-end Mac IIfx can. This month, I'll describe some of the technicalities behind MIDI and spotlight some entry-level as well as professional MIDI hardware and software.

MIDI Basics

MIDI data can travel in two directions at the same time—from an instrument to a computer and from a computer to an instrument, for example. To accommodate this two-way traffic, every MIDI device has two connectors: *MIDI In* and *MIDI Out*. Some devices have another connector as well, *MIDI Thru*, which can be used for chaining MIDI devices together.

Peer behind the Mac and you'll notice there are no such connectors. Unlike some personal computers (specifically a few Atari models), Macs don't come equipped for MIDI but need a separate piece of hardware—a *MIDI interface*, which connects to the Mac's modem or printer port and provides MIDI In and MIDI Out connectors. Several are available for the Mac, ranging from Apple's (408/996-1010) $99 Apple MIDI Interface to Mark of the Unicorn's (617/576-2760) $495 MIDI Time Piece and J.L. Cooper Electronics' (213/306-4131) $349 SyncMaster. The higher-end MIDI interfaces provide more MIDI In and MIDI Out connectors and allow the Mac to be synchronized with an external device such as an audiotape recorder (see "Mac MIDI Interfaces").



"The Ins and Outs of MIDI Connections" shows three different ways to connect MIDI instruments with an interface to relay MIDI data (also called *messages* or *events*) between instruments and a Mac.

But what kind of data? First and foremost, *note data*. When you play a MIDI instrument's keyboard, it tells the Mac which keys were pressed and for how long. *Velocity-sensitive* keyboards also note how hard each key was pressed, letting the Mac capture the varied dynamics of your performance.

Incidentally, MIDI instruments don't necessarily have to have piano-like keyboards. They can take other forms, ranging from the self-explanatory *MIDI guitar* and *drum pad* to the not-so-self-explanatory, saxo-

(continues)

MAC MIDI INTERFACES

Model	Company	MIDI In Connectors	MIDI Out Connectors	Sync Support	Retail Price
Altech 1 x 3	Altech Systems	1	3	no	$99.95
Altech 2 x 6	Altech Systems	2	6	no	$149.95
Apple MIDI Interface	Apple Computer	1	1	no	$99
MacNEXUS	J. L. Cooper Electronics	1	3	no	$69.95
SyncMaster	J. L. Cooper Electronics	2	6	yes	$349
MIDI Time Piece	Mark of the Unicorn	8	8	yes	$495
Professional Plus	Opcode Systems	1	3	no	$125
Studio 3	Opcode Systems	2	6	yes	$495
Studio Plus Two	Opcode Systems	2	6	no	$225
MH-01M	Passport Designs	1	1	no	$130
MIDI Transport	Passport Designs	2	4	yes	$495

phone-like *wind controller*. MIDI-equipped accordions are available, as are retrofits that add MIDI to organs and acoustic pianos. Instruments that generate MIDI data are often called *controllers*. Many musicians combine one controller with several *sound modules*—boxes containing sound-generating circuitry and MIDI connectors, but no keyboards. E-mu Systems' (408/438-1921) remarkable Proteus is one popular sound module.

MIDI instruments can receive or transmit data on any of 16 independent *channels*—electronic mailing addresses that accompany MIDI data and specify its destination. Not only can you specify the channel MIDI instruments use to transmit data, you can also configure them to respond to data sent on all MIDI channels (*omni* mode) or only to certain ones (*poly* mode).

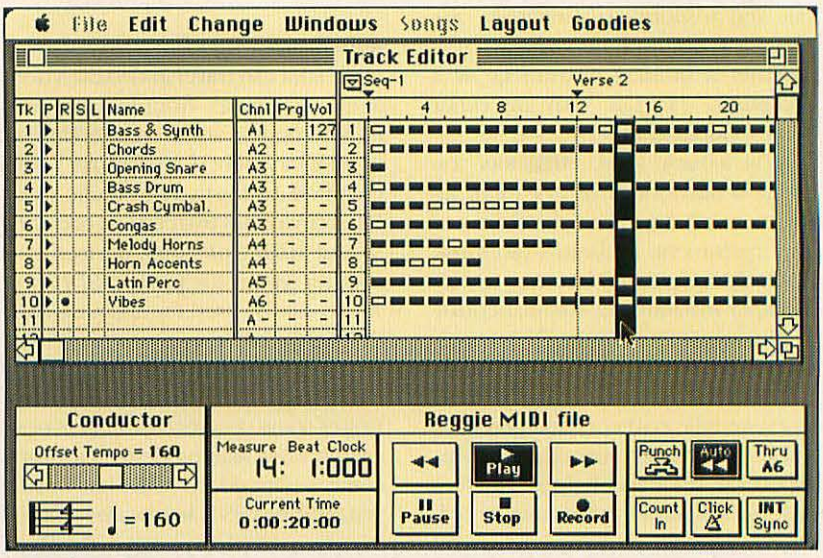
This ability to channel MIDI data is important because many MIDI setups comprise more than one instrument, some of which may be *multitimbral*—capable of simultaneously producing different types of sounds, such as those of a drum set and a horn section. If you couldn't assign certain MIDI data to certain channels, there'd be nothing to stop one instrument from playing another's part.

Note data is by no means the only kind of information that can travel on MIDI cables. Here are some MIDI messages that instead of playing notes play other roles in the performance.

- *Program changes* instruct an instrument to switch sounds—from piano to strings, for example.
- *Continuous data* generally modifies the way a sound is played. For example, many instruments have *pitch bend* wheels or levers that let you slide between pitches the way guitar players do when they bend a string. Another kind of continuous data is *aftertouch*, which describes how hard a note key is being held down. By pressing harder on a key after you've pressed it, you might add vibrato or cause a string sound to get progressively louder. Not all keyboards send aftertouch, but those that do allow for a greater range of expression.
- *Clock* or *sync data* carries information about the timing of a MIDI performance. It's often used to synchronize a network of MIDI instruments to an audiotape recording.
- *System-exclusive data* is information pertinent to a specific model of MIDI instrument, such as the contents of its internal memory, or the MIDI-channel assignments of its sounds. By transferring system-exclusive data to the Mac, you can store and alter an instrument's sounds, and then transfer the data back to the MIDI instrument.

Software to Make Music By

Without a computer, MIDI data plays a valuable but limited role—it lets you play numerous instruments using just one controller. MIDI data becomes much more useful when it's combined with a computer and software that can store and manipulate it. The most popular of MIDI software is the *sequencer*, a kind of tapeless tape deck that lets you build your own arrangements by recording parts one *track* at a time. You might start with a drum or bass track to establish a rhythm, and perhaps specify that it *loop*, or repeat continuously. Next, you might add a guitar melody, then some strings to sweeten things up. During playback, you route the tracks to the appropri-



Laying Down Tracks

Sequencers (such as Passport Designs' Pro 4, shown here) let you record and play back MIDI data. The dark bars on the right indicate the presence of MIDI data in those measures. At the top of the window is a *marker* (here named Verse 2), which you can create to quickly access a specific point. Most sequencers provide these basic features.

ate instruments—or to the appropriate sounds within a multitimbral instrument—by specifying a different playback channel for each one (see "Laying Down Tracks").

On the surface, a sequencer seems similar to a multitrack tape recorder or to a digital audio–recording system such as Digidesign's (415/726-0280) Sound Tools (see "Getting Started with Digital Sound," November 1989). But a sequencer doesn't store sound; instead, it stores the sequence of MIDI data that describes what you played.

That storage technique has a few significant pluses. First, MIDI data requires far less disk space than digital audio data does. A ten-minute stereo recording made with Sound Tools requires 100MB of disk space; a ten-minute MIDI sequence might use 30K or so. Also, because the MIDI data in a sequence isn't tied to a particular sound, you can change an instrument's settings before or during playback to hear how that electric guitar part sounds when played by an acoustic guitar—or maybe an oboe. Or, you can work up an arrangement using an economical home system and then take your disk into a recording studio and play the sequence using state-of-the-art gear.

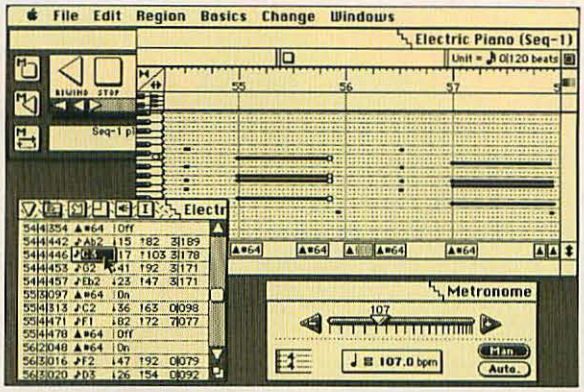
And because you're working with MIDI data, you can continue adding tracks without compromising the sound quality. With an audio recording, each time you *bounce* two or more tracks to a single track to free up a track for recording, the sound quality of the older tracks suffers. With a sequencer, the tracks exist in the Mac's memory, not on audiotape. So you can add as many tracks as you have memory for, and every playback is an original performance.

Perhaps best of all (at least for those of us who can't practice eight hours a day), you can use a sequencer's extensive editing features to correct misplayed notes or to add more dynamic expression. You can cut and paste sections of a recording—for example, to remove extra verses or repeat a part. And with a sequencer's *step recording* mode, you can manually enter difficult parts one note at a time, or slow down the tempo and record them at a more leisurely pace. Is it cheating? Some might say so, but it lets you make better music, and the results go a long way toward soothing your guilt.

Sequencer Features

Let's take a closer look at the kinds of features you'll find in the sequencers currently or soon to be available for the Mac.

For correcting or inserting notes in existing tracks, two basic schemes exist. *Graphic* editing displays a track's contents on a music staff–like grid, except that notes are shown as horizontal bars, with longer bars representing longer notes. Graphic editing lets you select and drag notes from one position to another using the mouse.



Editing Tracks

Higher-end sequencers such as Mark of the Unicorn's Performer (shown here) offer two types of note-editing windows: graphic (upper right) and event-list (lower left). The entries reading #64 indicate the press and release of a MIDI keyboard's sustain pedal.

Event list editing displays a track's contents as a table of MIDI data. It doesn't give you the click-and-drag convenience of graphic editing, but it allows for greater precision, since you can type and edit the exact values that describe individual notes or other MIDI data. Better sequencers provide both types of editing windows (see "Editing Tracks").

For tweaking the timing of notes, sequencers provide *quantizing* features, which cause the program to move notes to the nearest note value you specify. If used excessively, however, quantizing can give sequenced music an overly mechanized feel; after all, no one plays every note *exactly* on time. To eliminate this undesirable side effect, most sequencers let you specify a margin within which notes aren't quantized, and thus you can neaten up your playing without making it sound robotic. Some sequencers also provide a *humanize* option, which does the opposite of quantizing: it nudges notes off their exact beat values to improve the feel of a passage that was overly quantized or entered using a step-recording mode.

Many pieces of music don't have the same tempo throughout. To accommodate such pieces, sequencers provide a special track, often called a *conductor track,* that stores tempo information. Using the conductor track, you can create a *tempo map* that describes the tempo changes in the piece. With some sequencers—including Mark of the Unicorn's Performer, Opcode Systems' (415/321-8977) Vision, Steinberg-Jones's (818/993-4091) forthcoming Cubase, and Electronic Arts' (415/571-7171) Deluxe Recorder—you can specify the tempo by tapping a key on a MIDI keyboard.

If you combine a sequencer with external equipment, such as a multitrack audiotape recorder, you'll need a sequencer that can be locked to synchronization codes sent by that external source. By recording a *sync track* on a tape recorder and feeding that track into a sync-supporting MIDI interface such as MIDI Time Piece, you keep the sequencer and recorder in exact synchronization. You can use sync to add sequenced electronic music to an acoustic recording, or to create a multitrack audio recording using a single MIDI instrument to record one track at a time, synchronizing the sequencer's playback with the tracks you've already recorded on tape. Sync features are commonly used in TV and movie soundtrack production, in which MIDI sequences of music or even sound effects are synchronized to visual action. In these cases, a sequencer is synchronized to a film editor or videotape recorder using the industry standard *SMPTE* (Society of Motion Picture and Television Engineers) *time code.*

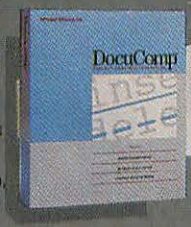
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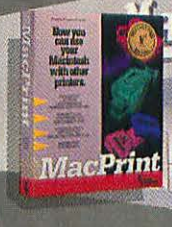
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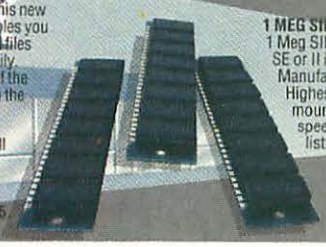
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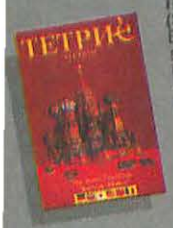
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If you're a pro, you might end up using more than one sequencer. Fortunately, virtually all support the standard *MIDI file* format, which enables sequencers—even ones running on different computers—to exchange recordings. Often MIDI files are also used along with *scoring* programs—the next stop on our MIDI tour.

Music Processors

Scoring programs let you print music using conventional notation. They do for composers what word processors do for writers—they let you easily correct and revise a piece without a lot of erasing (see "Scoring Software").

Even more exciting, scoring programs can transcribe music as you play it on a MIDI keyboard. Real-time music transcription has been a fantasy of musicians for years, and the dream still hasn't been completely fulfilled. The primary problem is one I mentioned before—nobody plays every note exactly on time. A real-time transcription is likely to have a large number of awkward rests and unusual note values you'll need to clean up using the scoring program's editing features. Scoring programs help you get better results by quantizing data as you play it (or load it from a MIDI file), but don't expect perfect notation the first time around. These real-time entry features are most effective when used as a starting point.

At this writing, numerous scoring programs are available for the Mac, including Mark of the Unicorn's Professional Composer, Passport Designs' NoteWriter and Encore, Coda's (800/843-2066) Finale and MusicProse, Electronic Arts' Deluxe Music Construction Set, and Great Wave Software's (408/438-1990) ConcertWare+MIDI. Deluxe Music Construction Set and ConcertWare+MIDI provide beginner- to intermediate-level scoring features. The rest are geared toward professionals and offer more control over the elements of a score. You'll want to evaluate each program to find the one that best handles the notation requirements of the style of music and the instruments you're writing for.

Sounds Good

Another useful category of MIDI software is the *editor/librarian,* which lets you manage, alter, and save a MIDI instrument's sounds by manipulating the system-exclusive MIDI data I mentioned earlier. You might use an editor/librarian to tweak an existing sound to your liking or to create a new sound from scratch. You can alter a MIDI instrument's sounds using its front-panel knobs and switches, but an editor/librarian makes it easier by taking advantage of the Mac's graphical operating style. For example, giving a sound a sharper, more percussive quality might require 15 minutes of twiddling with an instrument's knobs while squinting at its small, calculator-like display. With an editor/librarian, you can edit an on-screen version of the sound, clicking and dragging its components until you get the sound you want. Editor/librarians are available for all popular MIDI instruments, and some, such as Opcode's Galaxy, can work with numerous instruments.

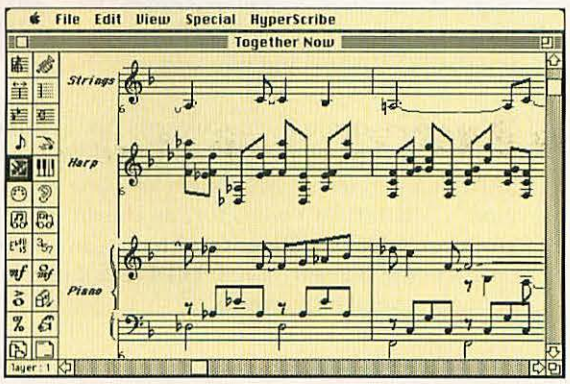
Similar to editor/librarians are *sample-editing* programs such as Digidesign's Sound Designer II or Pass-

(continues)

CHOOSING A SEQUENCER

Sequencer software firms keep a close eye on the competition, releasing updates so often that you'll rarely find any one program well ahead of the others. Given that, here are some issues that are likely to influence your buying decision.

- **Program design** As with any kind of program, some sequencers are easier to use than others. I'm partial to Performer and Pro 4. Vision provides a few more features, but it's harder to learn. Try a few programs and pick the one you feel comfortable with.
- **Memory requirements** Memory efficiency is critical with sequencers, since the length and complexity of your songs is limited by the amount of free memory available. Performer, with its flashy user interface, requires 2MB of RAM for serious work; most other programs can run comfortably with 1MB.
- **Copy protection** Most software makers stopped this practice years ago, but this inconvenience persists in the sequencer world. Before a protected sequencer will run, you have to insert a master floppy disk or perform a convoluted installation process on your hard disk. It's annoying, and potentially devastating if you use a sequencer at live jobs ("Sorry, folks—no music tonight. The band's master disk went bad."). Of the sequencers shipping at this writing, only Pro 4, Deluxe Recorder, and Dr. T's Music Software's Beyond are not copy protected.
- **Cost** For most musicians, money is an object. The best buy in sequencers is Passport Design's Trax, scheduled to ship in June for $99.95.



Scoring Software

Notation programs such as Finale 2.0, shown here, let you commit music to paper by entering notes individually from a tool palette, playing a MIDI instrument, or importing a MIDI file created by a sequencer. The latter two approaches sound especially appealing, but music entered directly from a performance often requires extensive quantizing to compensate for minor timing inaccuracies.

port Designs' entry-level Sound Apprentice. Sample editors let you manipulate the digital sound samples that sampling instruments such as Ensoniq's (215/647-3930) EPS and E-mu Systems' Emulator III play. (For details on digital sound and samplers, see "Getting Started with Digital Sound," November 1989.)

If you have a sampler, you might also want to investigate Digidesign's Turbosynth software, which lets you design synthesized sounds on the Mac and then transfer them to a sampler for playback. TurboSynth gives a sampler—whose normal purpose is to play back digital recordings of real instruments—the sound-generating versatility of a synthesizer.

Every Combo Needs a Manager

If you try to run several MIDI programs simultaneously under MultiFinder, you may experience compatibility problems. That's because some MIDI programs monopolize the Mac's communications chips, preventing other programs from using them.

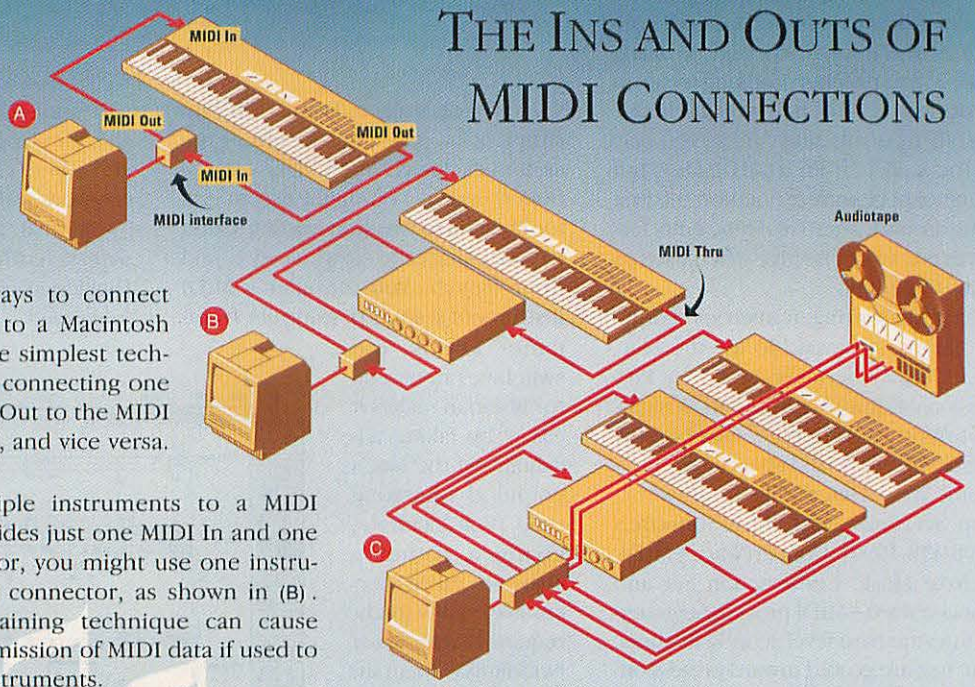
But chances are all your MIDI programs will peacefully coexist under MultiFinder if you use Apple's MIDI Manager, an enhancement to the Mac's system software that lets multiple MIDI programs run under MultiFinder and even share the same MIDI data. Instead of accessing the hardware directly, programs access the MIDI Manager, which in turn deals with the hardware.

For users of the Mac Portable, MIDI Manager isn't an option, it's a necessity. The Portable's battery-conservation features make it incompatible with MIDI software that directly accesses the machine's communications chips. If you have a Portable, use MIDI Manager version 1.2 or later. Apple also recommends using version System 6.0.5 or later to eliminate other possible compatibility problems with the Portable's modem and printer ports.

Alas, at this writing, not all MIDI programs have been updated to work with MIDI Manager. Opcode System's Vision does, but Mark of the Unicorn's Performer won't until later this year.

Sequencers, editor/librarians, and scoring programs are the primary players in the MIDI software world. On the fringes, you find programs such as Ars Nova Software's (805/564-2518) Practica Musica, Coda's Perceive, and Hip Software's (617/661-2447) Harmony Grid, which are all designed to help you train your musical ear and learn music theory. Also on the outskirts of MIDI territory, programs such as Coda's MacDrums, Primera Software's (415/525-3000) Different Drummer, and Dr. T's Music Software's (617/244-6954) UpBeat, which help you cre-

The Ins and Outs of MIDI Connections



Here are three ways to connect MIDI instruments to a Macintosh MIDI interface. The simplest technique (A) involves connecting one instrument's MIDI Out to the MIDI interface's MIDI In, and vice versa.

To connect multiple instruments to a MIDI interface that provides just one MIDI In and one MIDI Out connector, you might use one instrument's MIDI Thru connector, as shown in (B). However, this chaining technique can cause delays in the transmission of MIDI data if used to connect several instruments.

For advanced MIDI setups such as the one shown in (C), it's better to use a MIDI interface that provides numerous MIDI In and MIDI Out connectors, such as Mark of the Unicorn's MIDI Time Piece. With this technique, each instrument's MIDI In and MIDI Out connectors attach to independent MIDI In and MIDI Out connectors on the interface. The MIDI interface shown in (C) also provides an audiotape synchronization feature for use with a MIDI sequencer. To synchronize a sequencer to an audiotape, you first record a sync tone on one track of the tape. When you play back the tape, the interface reads the sync tones and controls the sequencer's playback speed to keep the taped and sequenced music synchronized.

ate slick drum and rhythm patterns, as well as avant-garde programs such as CTM Development's OvalTune (formerly published by Intelligent Music) and Dr. T's Music Software's groundbreaking "M," both of which turn the Mac into a MIDI controller. With these last two programs, you can record some basic phrases and then modify their playback during a performance by moving the mouse or clicking on various buttons and dials. My favorite program in this category of *performance software* is Scorpion Systems Group's (415/864-2956) sYbil. OvalTune and "M" turn some aspects of music making over to the computer, but sYbil puts all the creative control in your hands.

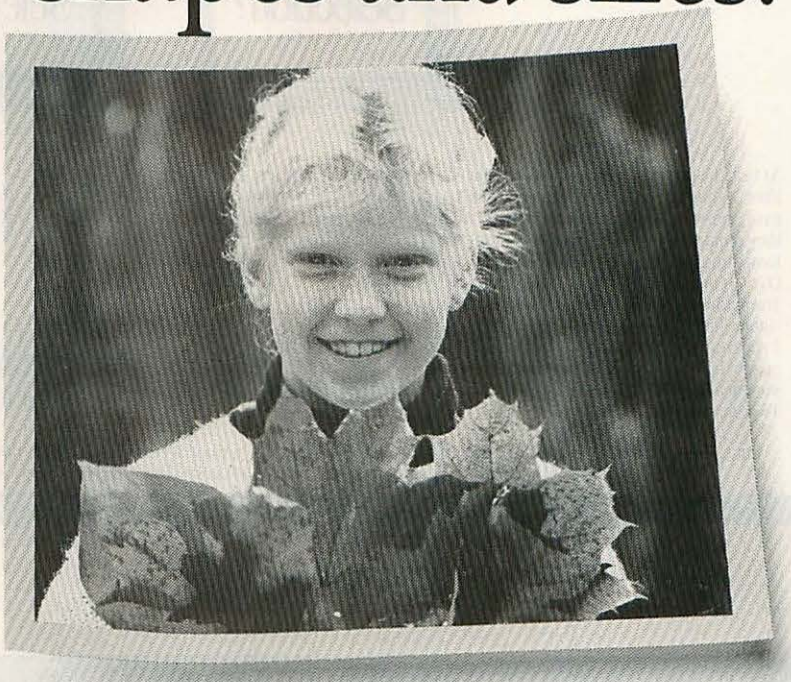
There are also MIDI programming tools such as Altech System's (318/226-1702) MIDI Basic and MIDI Pascal, and Hip Software's fascinating HookUp, a graphical programming language that lets you create MIDI-accompanied animations not by typing arcane programming commands, but by attaching icons to each other. You can even find prerecorded MIDI sequences, such as Passport Design's Music Data series, which includes elaborately produced sequences of hundreds of Top-40, rhythm-and-blues, country, and classical music pieces. You might use a canned sequence to fine-tune your arranging or improvisation skills, or as an accompaniment to a live performance. And you can also find MIDI support in multimedia programs such as MacroMind's (415/442-0200) Director. Director's MIDI support lets you trigger a sequenced piece of music or a sound effect at a particular time during an animation.

In short, you'll find as many ways to use the MIDI standard as there are ways to make music. It just goes to show you what a little cooperation can do. ■

See *Where to Buy* for contact information.

Jim Heid is a Macworld *contributing editor. His latest book, coauthored with Peter Norton, is* Inside the Apple Macintosh *(Brady Books, 1989). America Online subscribers can contact him directly by sending a message to Jim Heid.*

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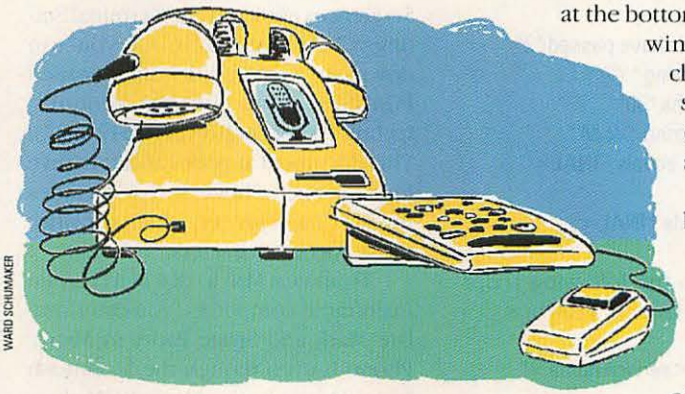
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Insights on MicroPhone II

TIPS AND TECHNIQUES FOR MAKING BETTER CONNECTIONS

BY TOM NEGRINO

Software Ventures' MicroPhone telecommunications program has gone through a constant evolution over the years. The current version, MicroPhone II 3.0, gives you the ability to create complete front ends for online services, and raises the standards by which terminal programs for the Mac should be judged. Thanks to Leonard Rosenthol, David Newman, and the technical support department of Software Ventures and MicroPhone power user Steve McIntosh for sharing their expertise.



WARD SCHUMAKER

Icons and Buttons

Take advantage of MicroPhone's ability to display multiple sets of buttons. Use scripts to install any buttons that match the actions available to you at that moment and to remove buttons that don't apply. When the choice of actions changes, the button bar should change to match the new choices. For example, after you've connected to an online service, you can replace the no-longer-needed Log On button with a Log Off button. Don't try to display every conceivable choice at once, when only a few are really available at that moment.

MicroPhone has an annoying limitation in naming button icons—you're restricted to a skimpy 8 characters. But fortunately, the name you assign to an icon does not have to match the name of the script it's associated with, which gives you greater flexibility in script naming. For example, you can have an icon called Mail, while its script has a more descriptive title, Get Today's Mail. Because the icon's name and the script's name are distinct entities, changing the name of a script does not change the icon's name.

If all the icons in your icon bar look like little MicroPhone II icons instead of unique custom icons, then reinstall the MPToolbox from MicroPhone II's original Utilities 1 disk.

If you want to modify a script associated with a button, hold down the Option key while clicking on the button to bring up the script editor.

To change a button's icon or title without going into the script editor, hold down the ⌘ key while clicking on the icon. This brings up the icon selector, enabling you to change the information.

To quickly realign the icon/button bar with the terminal window, hold down the Option key and click on the bar's Grow box (the double arrows in the lower-right corner).

Script Tips

If MicroPhone II appears to be frozen, before restarting check to make sure the program is not running a script that is simply waiting for a prompt (from either you or the remote computer). When a script is executing, MicroPhone II displays a stop sign at the bottom of the terminal window. You can click on the stop sign, or press ⌘-. (period), to abort a script.

Put a space before the names of scripts you use often so that they will appear at the top of the menu of scripts.

Holding down the mouse button while MicroPhone II 3.0 is launching prevents a Startup Action from running, so that you may modify it.

Tired of seeing the alert that asks if you want to save the current settings when you quit MicroPhone II or close a settings document? This typically happens when you connect to a service that supports a lower baud rate than that of your modem (for example, if a 2400-bps modem connects to a service that supports only 1200 bps); the modem driver automatically changes the modem's baud rate to accommodate the lower speed. You can use a closing-action script that automatically resets the settings to forever banish that annoying reminder (see "Closing Up"). However, once you've incorporated this script, if you

(continues)

decide you want to save a change you've made to the settings, make sure you save it immediately. Otherwise you'll lose the revised settings when you quit or close the document.

Within a script, if you've created a variable for temporary use and won't need it after the script has executed, delete the variable at the end of the script. Creating and destroying variables doesn't slow the script's execution, and it frees up a variable slot for use by another script. (MicroPhone II limits the number of variables in a given session to 100, so if you run several scripts during a complex session, you can easily reach the upper limit.)

Telenet, one of the data-packet networks used by many online services, can be tricky to connect to. The following script works in nearly all cases to log on to Telenet at 2400 bps.

```
Dial Service "<service name>"
Repeat
 When seconds have passed "2"
   Send text string "'@'"
   Wait sixtieths "30"
   Send text string "'^M'"
 Or when text equals "'INAL='"
 End when
Until text equals "'INAL='"
```

You can use the following script to connect to Telenet at 1200 bps.

```
Dial Service "<service name>"
Repeat
 When seconds have passed "2"
   Send text string "'^M'"
   Wait sixtieths "30"
   Send text string "'^M'"
 Or when text equals "'INAL='"
 End when
Until text equals "'INAL='"
```

Connecting and Downloading

To avoid interrupting an online session, disable Call Waiting. In most areas sending *70 to the modem before the phone number cancels Call Waiting for the duration of the call. The *70 turns off call waiting; the comma makes the modem wait while the phone company confirms (with a special tone) that call waiting has been turned off. So a dialing string like ATDT *70, 555-1212 does the trick.

If you routinely call bulletin board systems that run on IBM PCs and would like to take full advantage of the extra PC/ANSI extensions, you're in luck. MicroPhone II 3.0 can do this in two different forms. You can turn on the ANSI color extensions via the Accept ANSI Color Sequences choice in the Terminal Settings/Color dialog box. Or you can download a settings document called PCANSI.sit from Software Ventures' technical support BBS (415/849-1912). This document supplies an alternative font for MicroPhone II that includes the PC Character Set, which provides those special characters.

To allow a Mac to dial in to certain mainframe computers, you can simulate Mark and Space Parity in MicroPhone II even though the Macintosh Serial Driver in the Mac's ROM does not support them. (IBM mainframes use Mark parity; Prime mainframes use Space parity.) Just select the following communications settings. Space parity: 8 data bits, 1 stop bits, no parity, strip 8th bit. Mark parity: 7 data bits, 2 stop bits, no parity.

If you've got a 1200-bps modem designed for use in the United States and you plan to use it in Europe, you'll need to switch the modem to the CCITT V.22 standard. To do this, send the modem the command string ATB0 by typing it in the terminal window and pressing Return. Sending the string ATB1 resets the modem to the United States Bell 212A standard.

If your modem is properly installed, with the phone line plugged into it, and the modem responds with "NO DIALTONE" or seems unable to dial out, the modem may not be recognizing the dial tone. This is more likely to happen in rural areas or areas with unusual dial tones.

Try configuring the modem for blind dialing. This tells the modem to dial even if it doesn't recognize the dial tone. Usually, sending the command ATX3 to the modem will do this, but you should consult the modem manual, since many modems use the X register differently.

Using the correct file-transfer protocol can save you significant time and money. The most common protocol, Xmodem, is also the slowest; 1K Xmodem—which sends data in larger (1K) packets—is better but is still not nearly as speedy as Zmodem, the most efficient. Downloading a 33K file from GEnie took 3 minutes and 37 seconds with 1K Xmodem; the same file required only 2 minutes and 39 seconds as a Zmodem download. Zmodem isn't supported by all online services (it's offered on GEnie and BIX), but when Zmodem is available, it's the best protocol to use. And if you transfer files directly with other MicroPhone II 3.0 owners, using Zmodem can mean a smaller phone bill.

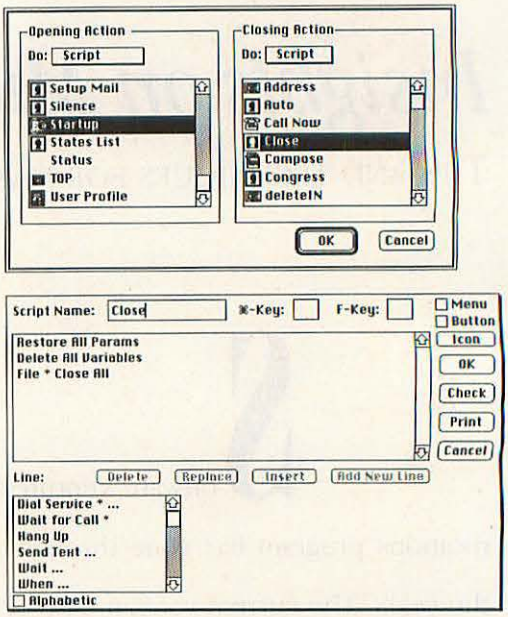
Fine-Tuning Online Services

To make sure Zmodem-protocol file-downloads work properly on GEnie, let MicroPhone autoreceive the file (choose Auto-detect in the Protocol Transfer dialog box under Settings)

(continues)

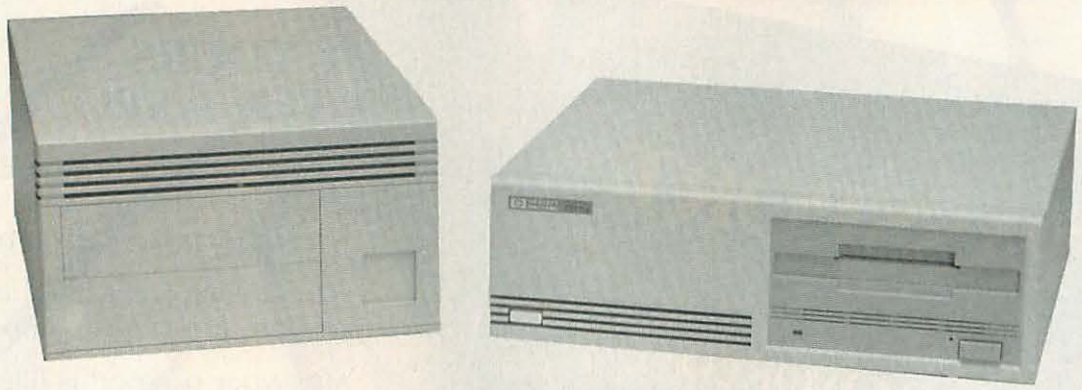
Closing Up

Under Turnkey Actions in the Settings menu, you can set scripts to run automatically at the start and end of your telecommunications session (top). Here, the Closing Action is to run the script called Close (bottom). The Close script's Restore All Params function restores the communications settings in effect at the beginning of the session and prevents MicroPhone II 3.0 from always asking if you want to save the settings when you quit or close a settings document.



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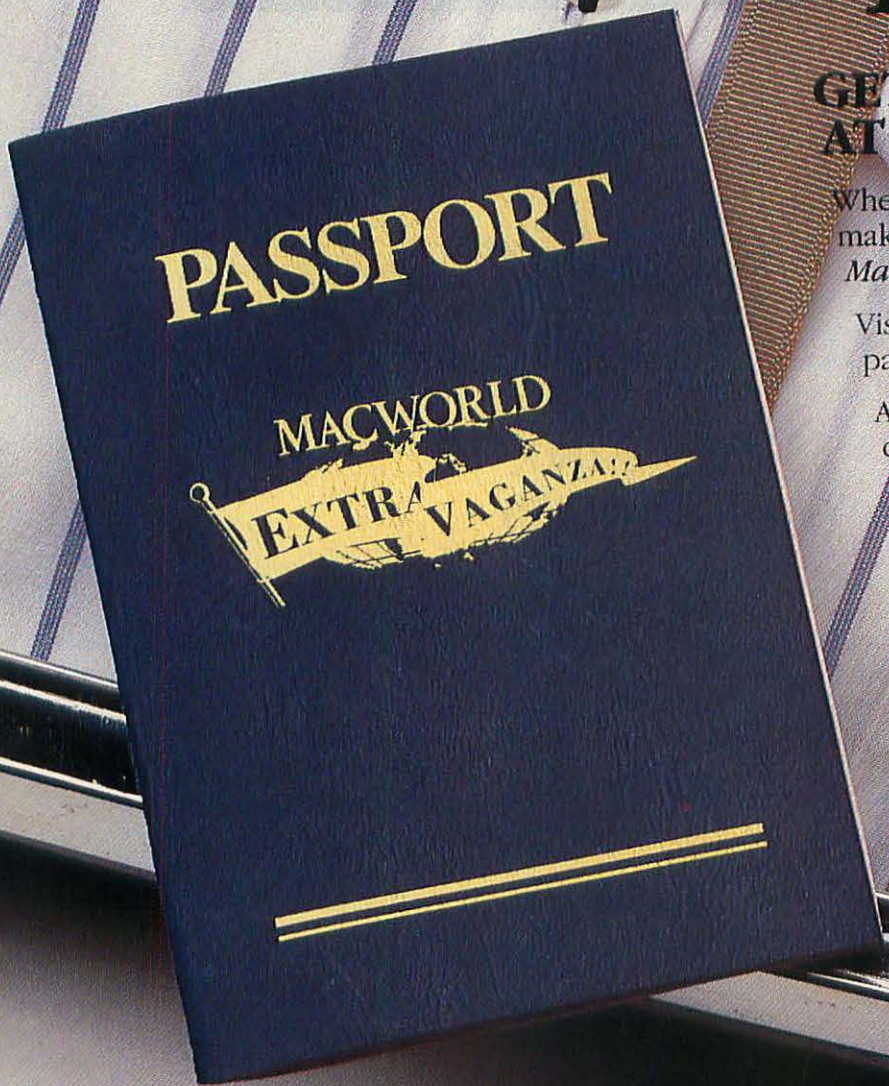
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instead of using the Transfer menu.

Logging on to the Official Airline Guide and Dow Jones News/Retreival services requires that MicroPhone II 3.0 be set to 7 bits with even parity.

If you use MicroPhone II to log on to real estate multiple-listing services, you'll probably need an answerback message to connect properly. Which answerback message you need depends on the service you're hooking up to. Check with the service provider for the correct procedure. To save an answerback message with the settings file, type the message in under the Terminal Setting menu choice.

Hardware Compatibility

The Hewlett-Packard DeskWriter printer driver does not support low-level (streaming) print routines. Since MicroPhone II uses those low-level routines to print, none of the script language's printer on and printer off commands work with the DeskWriter. If you install the MacPrint driver from Insight Development, the HP DeskJet printer does support low-level printing, so MicroPhone II's low-level script commands work fine.

The Macintosh Portable's Power Manager can cause problems with the serial ports. After being in system sleep for a few minutes, upon wake-up the modem (and MicroPhone II) cannot establish remote communication. Apple acknowledges the problem and has a fix, the Portable INIT (available from dealers and incorporated into System 6.0.5). If you can't find the INIT immediately, don't despair; resetting the Power Manager temporarily alleviates the communication problem. Shut down the Portable, hold down both the Reset and Interrupt keys, and turn the machine on.

To take full advantage of high-speed modems (greater than 2400 bps), Software Ventures recommends a special type of modem cable called a hardware handshaking cable. Using it in conjunction with such protocols as Ymodem-G and Zmodem, it gives you the best throughput for your modem.

Hayes V-Series modems are set to use hardware flow control at the factory, but the Mac does not support hardware flow control with a standard Mac-to-Hayes modem cable. A hardware handshaking cable will solve the problem, but even if you have no cable, you can still set the modem correctly. Issue the following command to the modem: AT&K0&W0 (zeros, not O's!) This command sets up the modem to use no handshaking as opposed to hardware handshaking.

Most modems set a limit on the length of a command string that they can accept (the Hayes standard command line is 40 characters). This may present a problem if you're dialing a long-distance number or you're using a telephone credit card. Since the dial command takes up 4 characters (ATDT), that leaves only 36 that can be used for the phone number. To work around this problem, use a script to break up the dialing string into three lines. To do this, you'll need a semicolon at the end of the dialing string, which tells the modem to return to command mode after dialing, ready to accept the next string. The script looks like this:

```
Send Text String "'ATDT Access
Phone Number;^M'"

Wait for Text "'OK'"

Send Text String "'ATDT Credit
Card Number;^M'"

Wait for Text "'OK'"

Send Text String "'ATDT
Destination Phone Number^M'"
```

Use of the semicolon in command strings is supported by most 2400-bps and by many (but not all) 1200-bps modems, so check your modem's manual to be sure that this will work for you. This script is a generic solution; it may need tweaking for your particular long-distance service.

Sharing the Wealth

If you've found a shortcut or undocumented trick not mentioned here, spread the word to other *Macworld* readers by sending it to *Quick Tips, Macworld,* 501 Second St., San Francisco, CA 94107. Ⓜ

See *Where to Buy* for contact information.

Tom Negrino is a Macintosh consultant and writer and is a director of the Los Angeles Macintosh Group.



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UPDATES

Here's our list of the current shipping versions of Mac software at the time we went to press. We hope you'll find it useful—because these days, keeping track of the latest CPU is tough enough.

Great Gantt version 1.2 includes import and export capabilities, custom data fields, and legends; displays start and end dates, milestones, and progress. Can tie text or graphics to a symbol, word wrap for left- and right-hand text columns, and globally change tasks. Varcon, 619/563-6700. Free; $195 new.

Q-Sheet A/V version 2.0 can be integrated with Digidesign's Sound Tools digital recording and editing system so you can add two independent tracks of digital audio to MIDI events such as sequences or sampled sound effects, synchronized to SMPTE. Can trigger recording and playback of Sound Tools from any SMPTE locations. Editing features include independent control over volume, stereo panning, and pitch shifting for each event. Digidesign, 415/688-0623. $50; $995 new.

Timeslips III for the Macintosh version 2.0 introduces new time-and-billing features such as those that let system administrator designate access privileges to specific system functions, or assign users to security groups with separate passwords. Has graphics capabilities. North Edge Software, 508/768-6100. Contact vendor for update policy. $299.95 new, multiuser version $699.95.

PRODUCT UPDATES

Product	V.	Req.	Rev.	Price
1st Aid Kit ★	2.8	512KE/3.0		*
4th Dimension	2.0	1MB/6.02	3/90	*
Aatrix CheckWriter II ★	2.01	512K/4.1		$10
Aatrix TimeCard	2.0	512K/4.2		Free
Accountant Inc.	2.1	1MB/6.02		$9.50
ACCPAC Bedford Simply Accounting	1.1	1MB/5.1		$50
AccuText ★	1.1	4MB/6.02	2/90	*
Adobe Type Manager	1.2	1MB/6.02	2/90	Free
AdWriter	2.0	1MB/6.0		Free
After Dark	1.1	512KE/3.2	7/90	$5
Alchemy	1.1	1MB/6.0		$25
Aldus FreeHand	2.0	1MB/6.03		*
Aldus PageMaker	4.0	1MB/4.1		*
Aldus Persuasion	2.0	1MB/6.0		*
AmPack Plus ★	4.2.2	512K/3.2	1/90	$29.95
Analog Connection WorkBench	3.0	1MB/5.0	5/90	$50
Anatool ★	3.1	512K/3.0		$35
AntiToxin	1.3	1MB/6.0.2	1/90	$15
APL.68000	7.0	512K/3.2		*
AppleShare File Server	2.0	512K/3.2		*
Archie	2.0	1MB/6.0		$75
ArchiText	2.0	1MB/6.02		Free
Aristotle's Politics	2.0	2MB/6.03		Free
The Art Importer	2.0	1MB/6.0	5/90	$20
ArtRoom	3.0	512K/3.2		$199
AutoCalc	2.0	1MB/6.0		$95
AutoSave II	1.1	512KE/4.2	7/90	$7.50
Aztec C	3.6	512KE/4.2		*
BackFax ★	1.02	1MB/6.03	1/90	Free
Back to Basics: Professional	2.0	512K/3.2		$75
Ball & Stick ★	2.2	1MB/6.0		Free
Bill-It	2.0	1MB/6.03		$29
Bridge	6.0	512K/3.2		$17
Business FileVision ★	1.5	1MB/6.02		*
Business Sense ★	1.2	1MB/6.0		*
Business Session ★	3.2	512K/3.2		Free
CA-Cricket Presents	2.0	1MB/6.0		Free
Calculator Construction Set ★	2.06	512K/3.2	4/90	$25
CanOpener	1.1	512K/3.0		Free
Canvas	2.1	1MB/6.0		*
Capture	2.0	1MB/6.0	2/90	$15
Central System Manager	2.1	1MB/5.0x		*
ChromaScan	1.1	4MB/6.02		Free
Client/Mac	2.0	1MB/6.0		$370
Colorset ★	1.5	1MB/6.0	6/90	Free
Colleague 2	2.1	2MB/6.03		Free
Comment	2.02	1MB/6.0		*
Commtact	2.0	1MB/6.0		Free
CompileIt	1.5	1MB/6.02	3/90	$30
CompuServe Navigator ★	2.1	512K/3.2		*
Computerized Classic Accounting	2.2	1MB/6.0		*
ConcertWare	5.1	512KE/4.2		$35
Control	1.5	1MB/4.1		Free
CopyFlow	2.0	2MB/6.0	6/90	Free
Cue	3.0	1MB/6.03		*
Data Desk	3.0	512K/4.02	6/90	$125
DataMerge	2.0	512K/3.2		Free
dBase Mac ★	1.01	1MB/4.1		Free
Deluxe Music Construction Set	2.5	512K/6.02	9/89	*
D.E.S.	4.0	1MB/6.0		*
Design Dimensions ★	2.15	5MB/6.03		Free
DeskPaint ★	2.10	512KE/4.2	5/90	Free
DiagramMaker ★	1.1	1MB/6.02		*
Digital Darkroom	1.1	1MB/6.02		Free
DiskExpress	**2.04**	**1MB/6.0**		**Free**
DiskFit	1.5	512K/4.1	12/89	$30
DiskTop	4.0	1MB/6.0		*
Display AdBuilder	1.1	1MB/6.03		*
Dollars and Sense	4.1	512KE/3.2		*
DragonWave	1.1	1MB/6.03		*
Dreams	1.1	1MB/6.02		*
DynaPerspective	2.0	2MB/6.04		Free
DynoDex ★	1.1	1MB/6.0	6/90	Free
Easy Color Paint	1.1	1MB/6.0		*
Empower II ★	3.03	1MB/4.2		Free
EndLink	1.1	512K/3.2		Free
EndNote	1.2	512KE/3.2		Free
Extender GrafPak	3.0	1MB/6.02		$30
Falcon	2.2	1MB/3.2		$3
Fastback II	2.1	512KE/4.1	12/89	$30
Fast Forms	2.0	512K/3.2		$25
Ferrari Grand Prix ★	1.6	512K/3.2		$10
FetchIt	2.0	512K/6.01		*
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GeoQuery	**2.0**	**1MB/6.0**		*
Gofer ★	2.01	1MB/4.1		$25
GQL	2.0	1MB/5.0		*
Great Gantt	**1.2**	**1MB/6.0**		**Free**
Great Plains Accounting Series	5.2	1MB/6.0		*
Hard Disk Partition	**3.02**	**1MB/6.0**		**$30**
Hard Disk Util	**3.0**	**1MB/6.0**		**$65**
Help DA	3.0	1MB/6.0		Free
HFS Backup	3.0	512K/3.2		$35

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Bold *= first time the product is being listed.*

★ *= minor update.*

Req. *= min. RAM and system software required.*

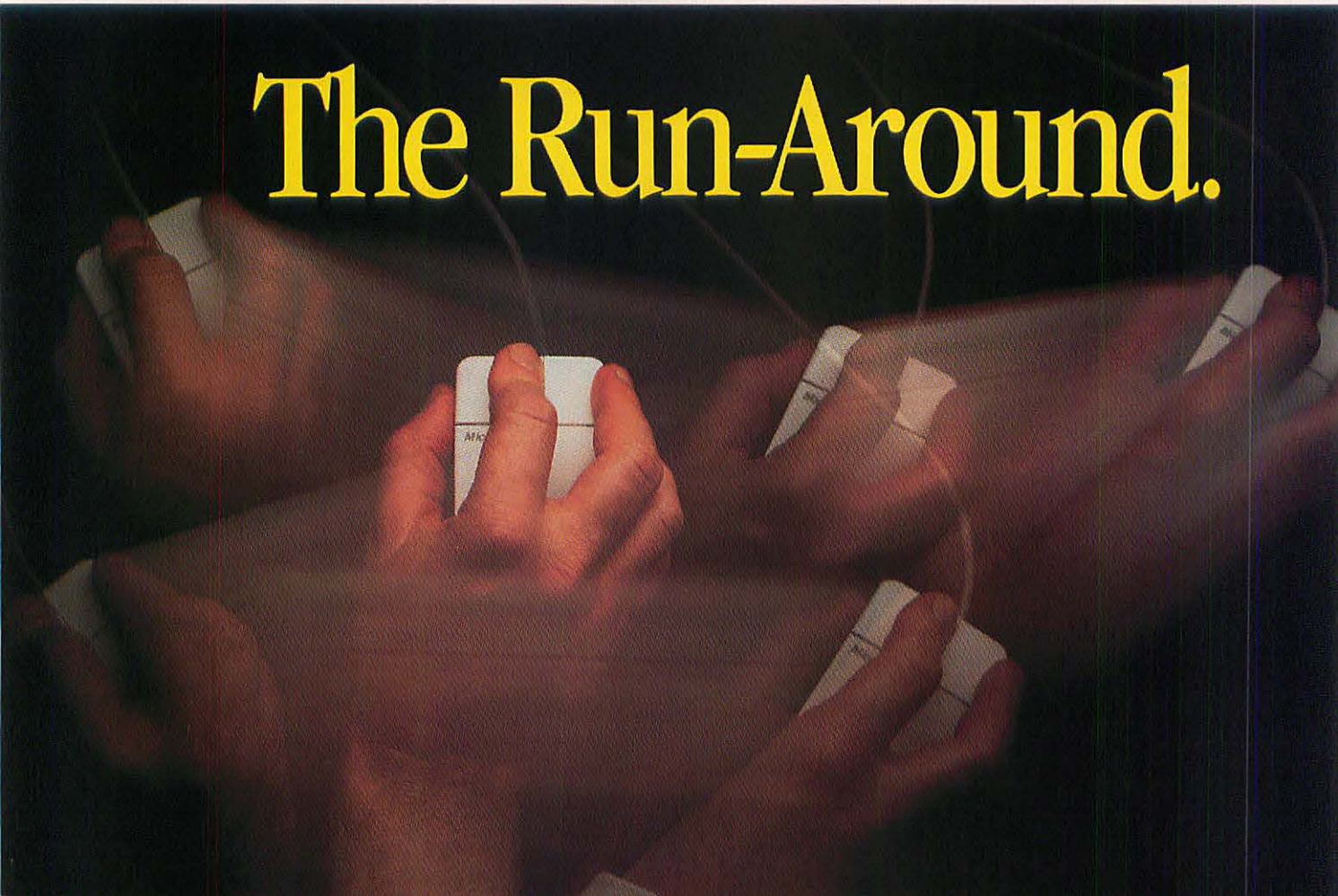
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PRODUCT UPDATES

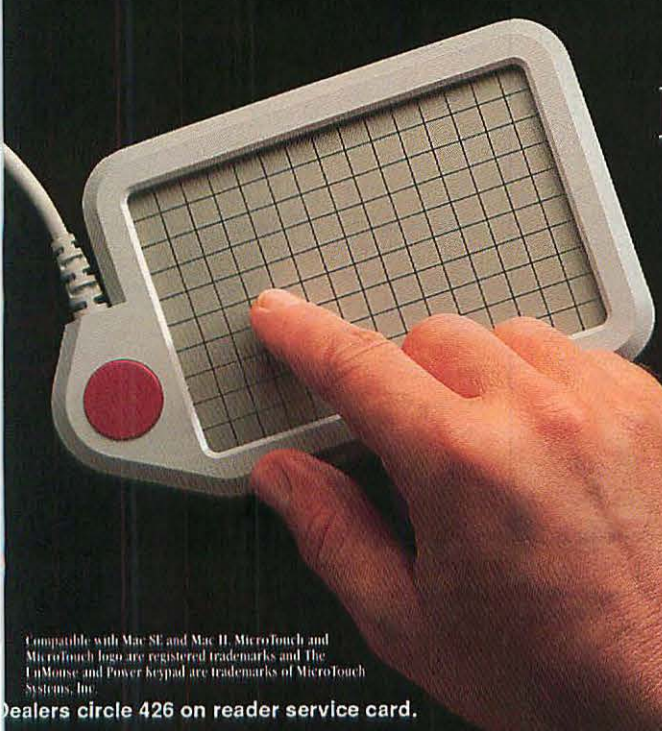
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HydroMac	2.0	1MB/6.0		*
HyperAnimator ★	1.5	1MB/6.03		$29.95
HyperCard ★	1.2.2	1MB/6.03		$10
HyperDA ★	1.2	512K/3.2		$10
HyperEngine	1.1	1MB/6.03		Free
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HyperWindows ★	1.2	1MB/6.02		$20
Icon-It	2.0	1MB/6.02		$29
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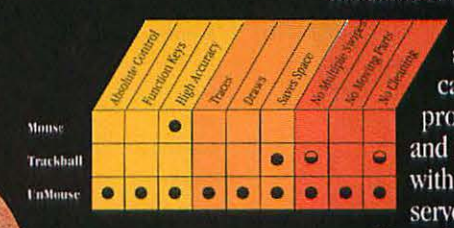
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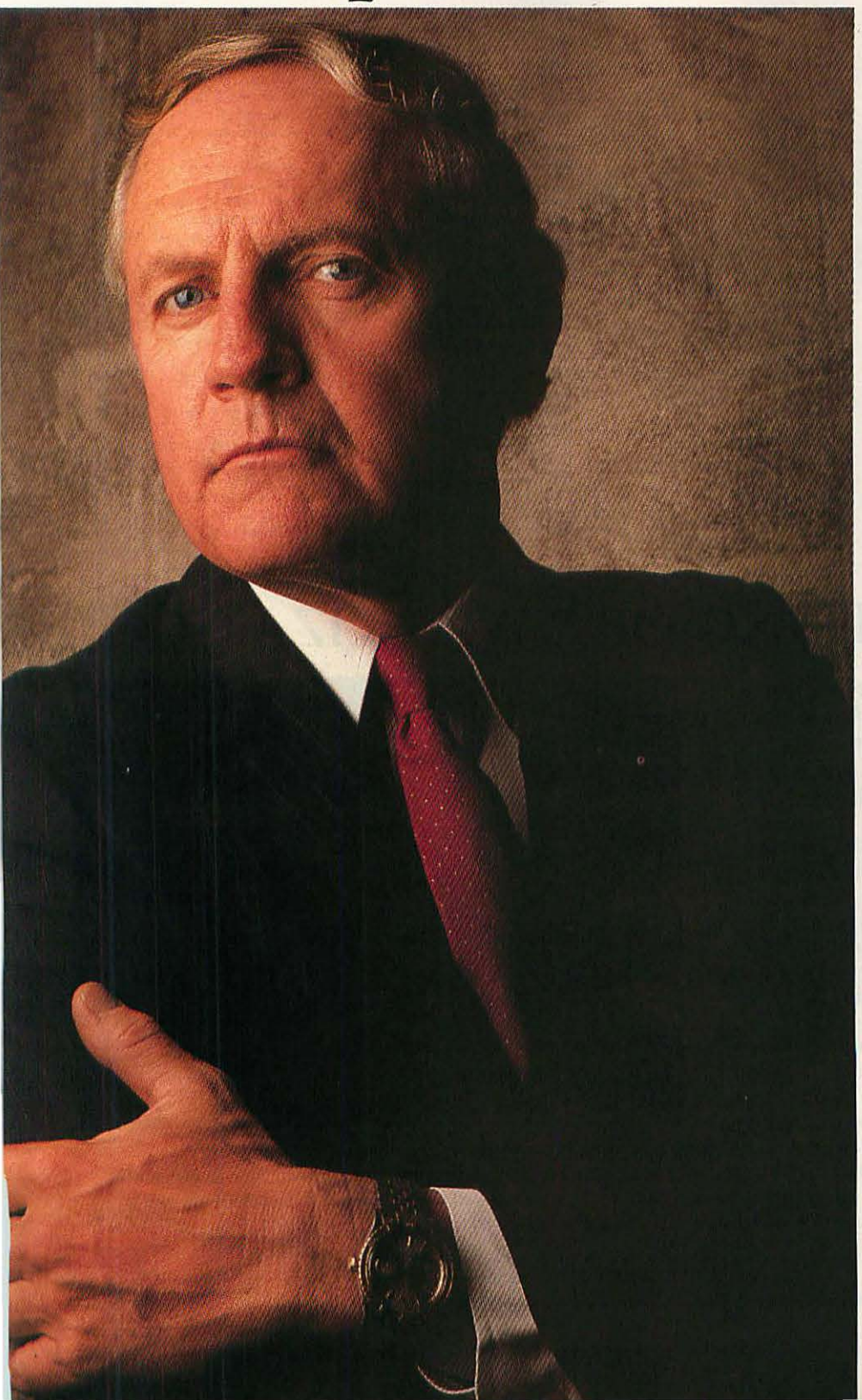
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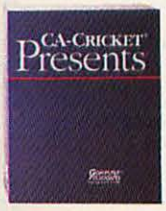
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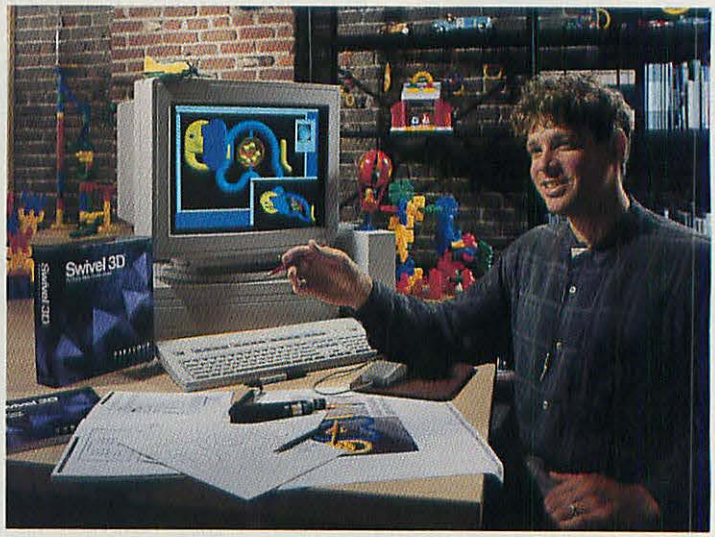
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701 **3+Open** 3Com Corp.; 408/562-6400.
702 **3+Share** 3Com Corp.; 408/562-6400.
703 **2400 Data and Fax Portable Modem** La Cie; 503/691-0771.
704 **Accelerator 16** Radius; 408/434-1010.
* **Address Book** Shareware by Jim Leitch.
705 **Adobe Photoshop** Adobe Systems; 415/961-4400.
706 **Alarming Events** CE Software; 515/224-1995.
707 **AlisaShare** Alisa Systems; 818/792-9474.
708 **allShare** Everyware; 416/569-3568.
709 **Altech MIDI Interface, Altech MIDIFace II** Altech Systems; 318/868-8036.
710 **AntiToxin** Mainstay; 818/991-6540.
711 **AppleFax Modem** Apple Computer; 408/996-1010.
712 **AppleLink** Apple Computer; 408/996-1010.
713 **Apple MIDI Interface** Apple Computer; 408/996-1010.
714 **AppleShare File Server, AppleShare PC** Apple Computer; 408/996-1010.
715 **AutoSave II** Magic Software; 402/291-0670.
716 **BackFax** Solutions; 802/865-9220.
717 **The Bard's Tale** Electronic Arts; 415/571-7171.
* **Boomerang** Shareware by Hiro Yamamoto.

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718 **CanOpener** Abbott Systems; 914/747-3116.
719 **CasioLink for the Macintosh** Traveling Software; 206/483-8088.
720 **ChromaScan** Imagenesis; 512/824-1746.
721 **CIS 3510, CIS 3515, CIS 4520** Color Imaging Systems; 415/521-3388.
722 **ClearScan 300 MCO** NCL America; 408/734-1006.
723 **ColorGetter** Optronics, an Intergraph division; 508/256-4511.
724 **ColorStudio** Letraset Graphic Design Software; 201/845-6100.
* **Complete Undelete** 1stAid Software; 617/783-7118.
725 **ConcertWare+MIDI** Great Wave Software; 408/438-1990.
726 **Cubase** Steinberg-Jones; 818/993-4091.
727 **DataLink Express, DataLink/Mac, DataLink Mac/Portable** Applied Engineering; 214/241-6060.
728 **DaynaNet** Dayna Communications; 801/531-0203.
729 **Deluxe Music Construction Set** Electronic Arts; 415/571-7171.
730 **Deluxe Recorder** Electronic Arts; 415/571-7171.
731 **Different Drummer** Primera Software; 206/644-4201.
732 **DirectServe** Jasmine Technologies; 415/282-1111.
733 **DiskExpress II** ALSoft; 713/353-4090.
734 **DiskTools Plus** Electronic Arts; 415/571-7171.
735 **DiskTop** CE Software; 515/224-1995.
736 **DoveFax Desktop, DoveFax Networkable Desktop, DoveFax Networkable NuBus, DoveFax NuBus** Dove Computer Corp.; 919/763-7918.
737 **EasyShare** ShirtPocket Software; 602/966-7667.
738 **Eikonix 1435 Slide Scanner** Atex Commercial Publishing Systems; 617/276-7639.

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739 **Emulator III** E-mu Systems; 408/438-1921.
740 **Encore** Passport Designs; 415/726-0280.
741 **EPS** Ensoniq Corp.; 215/647-3930.
742 **EtherGate** Shiva Corp.; 617/864-8500.
743 **Eureka** Personal Computer Peripherals Corp.; 813/884-3092.
744 **FaxGate Plus** Solutions; 802/865-9220.
745 **FaxPro** Cypress Research Corp.; 408/752-2700.
746 **FaxShare** Solutions; 802/865-9220.
747 **FAXstf** STF Technologies; 816/584-7727.
748 **Finale** Coda Music Software; 612/854-1288.
749 **Findswell** Working Software; 408/423-5696.
750 **Flash** Beagle Bros; 619/452-5500.
751 **FlexFax 9624** Circuit Research; 603/880-4000.
752 **FM-4824 External Fax Modem, FMM-4824 Mini Fax Modem** GVC Technologies; 201/579-3630.
753 **Galaxy** Opcode Systems; 415/369-8131.
754 **Gemini 020/030** Total Systems; 503/345-7395.
755 **Gofer** Microlytics; 716/248-9150.
756 **Grappler Spooler** Orange Micro; 714/779-2772.
757 **HandOff** Software Innovations; 214/727-2329.
758 **Harmony Grid** Hip Software Corp.; 617/661-2447.
759 **HookUp** Hip Software Corp.; 617/661-2447.
760 **Icon-It** Tactic Software; 305/378-4110.
761 **InterFax 12/48, InterFax 24/96** Abaton, a subsidiary of Everex Systems; 415/683-2226.

Reader Service

762 **JX-100M, JX 300, JX 450, JX 600** Sharp Electronics Corp.; 201/529-9500.
763 **K-AShare** Mt Xinu; 415/644-0146.
764 **LapLink Mac III Network Pac** Traveling Software; 206/483-8088.
765 **LaserServe** Infosphere; 503/226-3620.
766 **LaserWriter IINT, LaserWriter IINTX** Apple Computer; 408/996-1010.
767 **LightFax 9624** Computer Friends; 503/626-2291.
* **LS-3500 Color Film Scanner** Nikon, Electronic Imaging Dept.; 516/222-0200.
768 **"M"** Dr. T's Music Software; 617/969-6657.
769 **MacDrums** Coda Music Software; 612/854-1288.
* **Macintosh Allegro Common Lisp** APDA-Apple Computer; 800/282-2732.
770 **MacNexus** J.L. Cooper Electronics; 213/306-4131.
771 **MacroMind Director** MacroMind; 415/442-0200.
772 **MacServe** Infosphere; 503/226-3620.
773 **MacSpool** Mainstay; 818/991-6540.
774 **Mac-to-Mac** Caravelle Networks Corp.; 613/591-7572.
775 **MacTools Deluxe** Central Point Software; 503/690-8090.
776 **MaraThon 020, MaraThon 030** Dove Computer Corp.; 919/763-7918.
777 **MarcoPolo** Mainstay; 818/991-6540.
778 **MasterJuggler** ALSoft; 713/353-4090.
779 **MaxSPITBOL** Catspaw; 719/539-3884.
780 **Mercury-16** Total Systems; 503/345-7395.
781 **MET 2400PF** Micro Electronic Technologies;

(continues)

Reader Service

508/435-9057.

782 **Metamorphosis** Altsys Corp.; 214/424-4888.

783 **Microsoft Excel Money Manager** Microsoft Press; 800/677-7377.

784 **MicroStation Mac** Intergraph Corp.; 205/730-2000.

785 **MIDI Basic, MIDI Pascal** Altech Systems; 318/868-8036.

786 **MIDI Hits, MIDI Interface, MIDI Records, MIDI Transport** Music Data, division of Passport Designs; 415/726-0280.

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873 **Vision** Opcode Systems; 415/369-8131.

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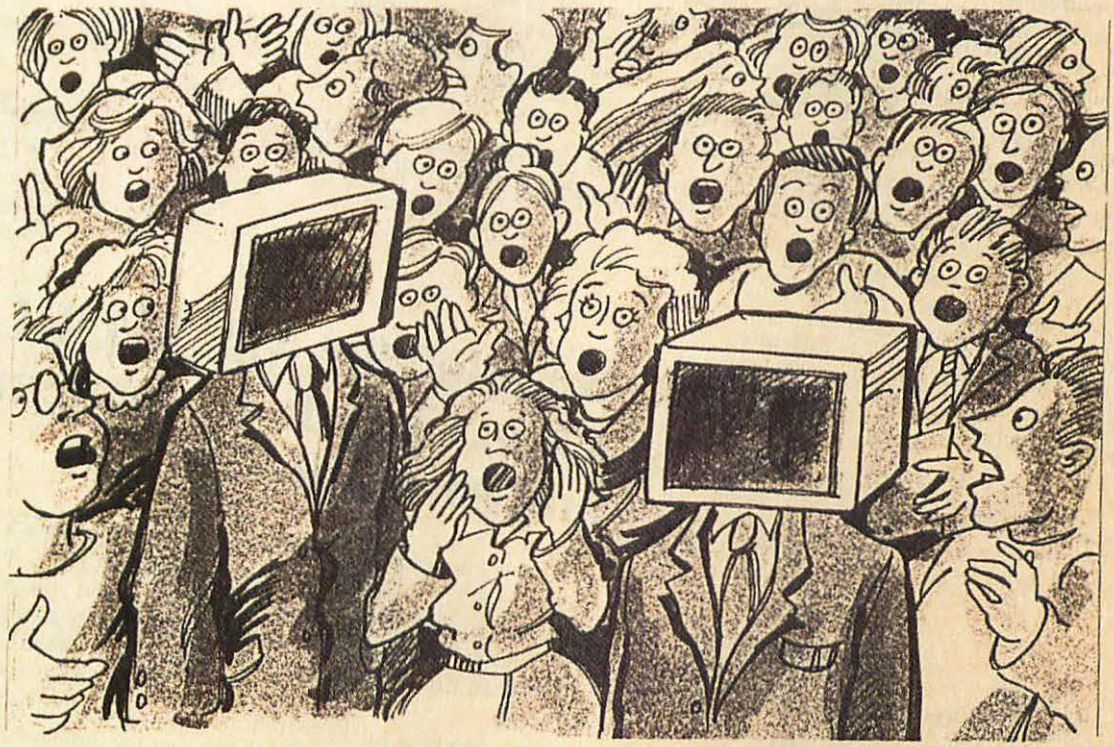
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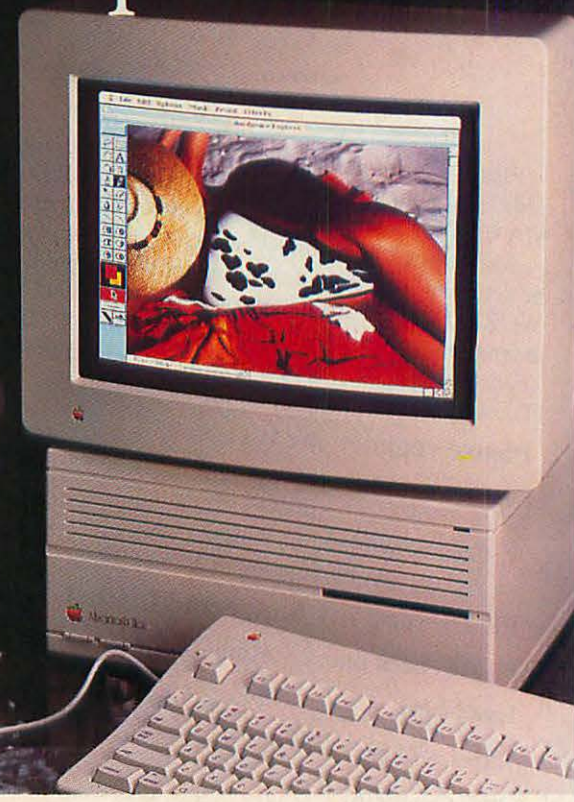
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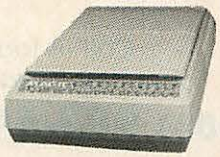
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MacUser, December 1989

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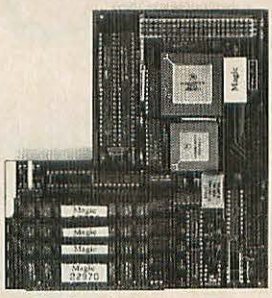


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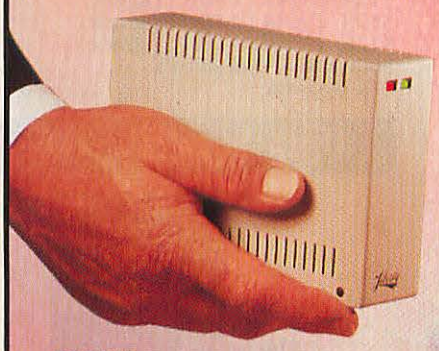
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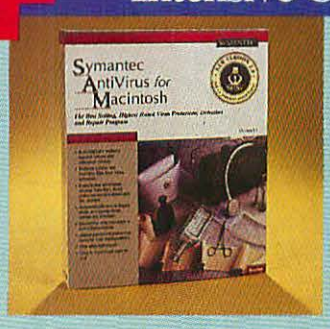
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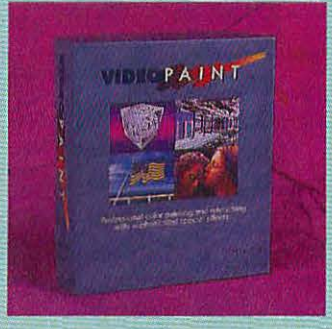
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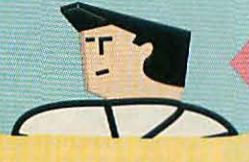
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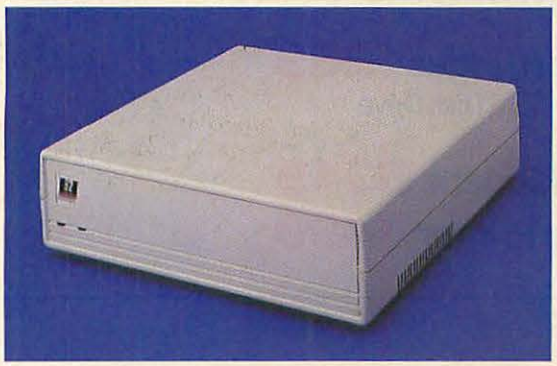
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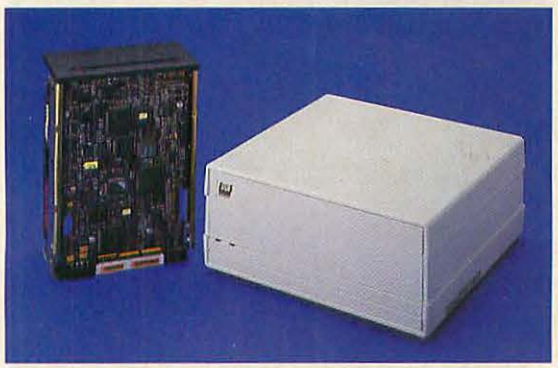
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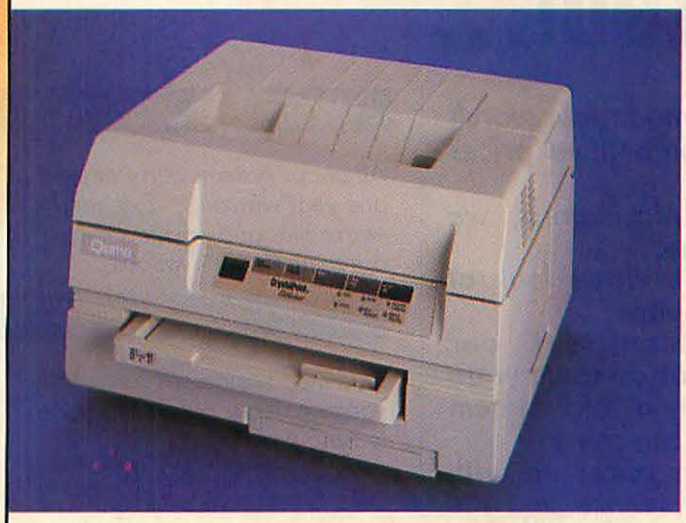


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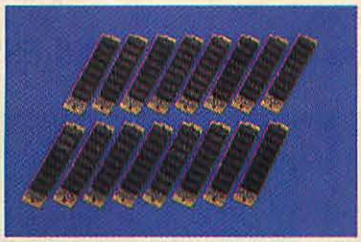
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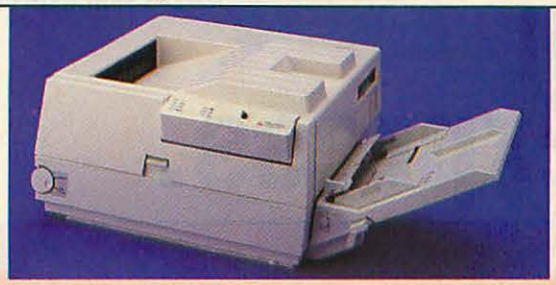


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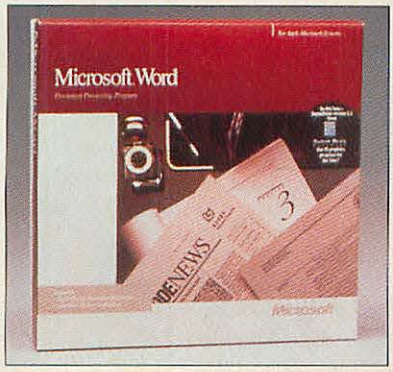
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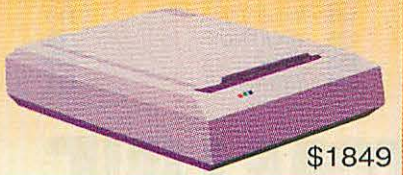
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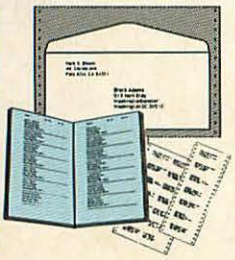
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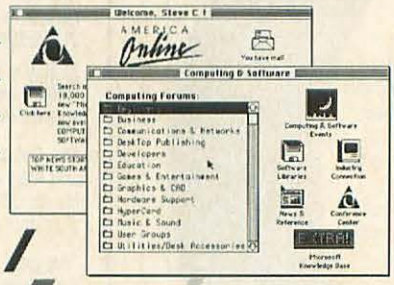
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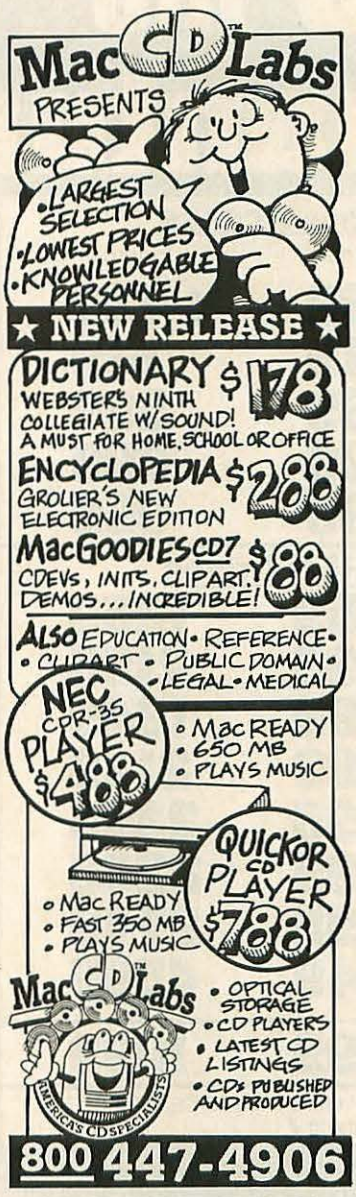
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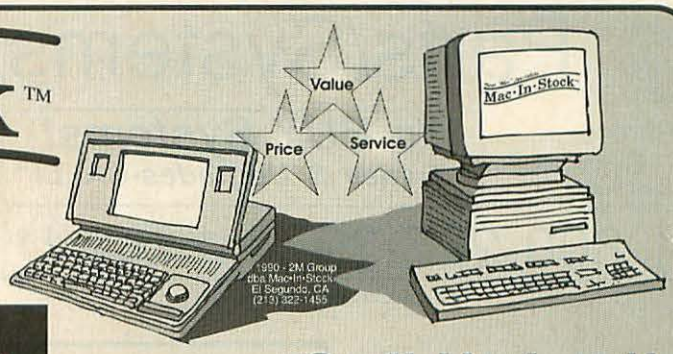
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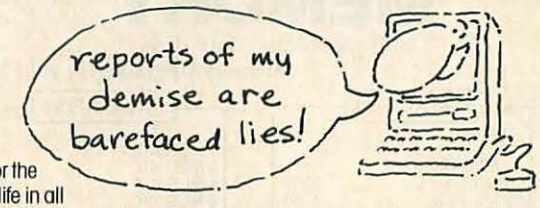
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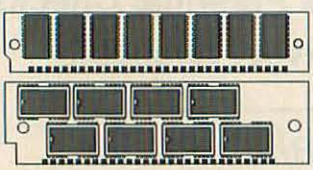
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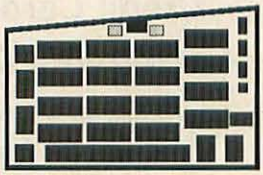
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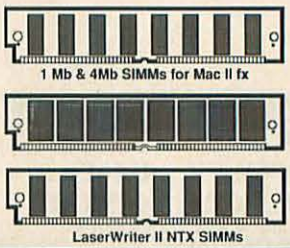
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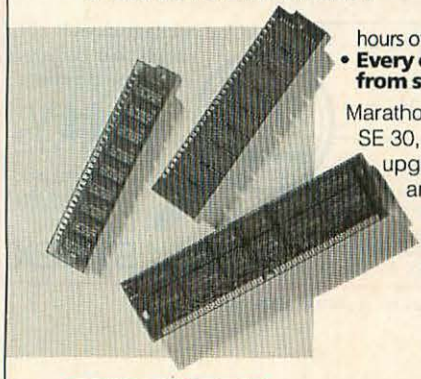
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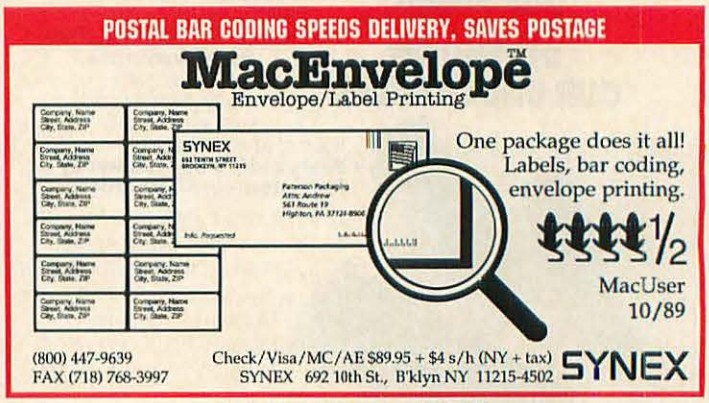
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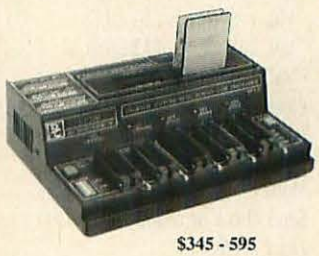
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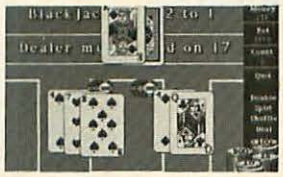
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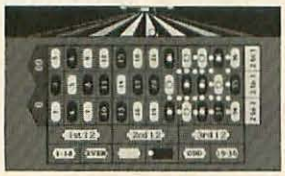
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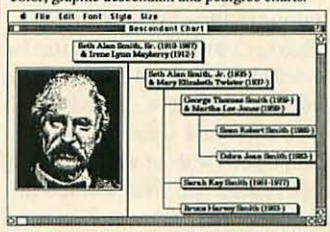
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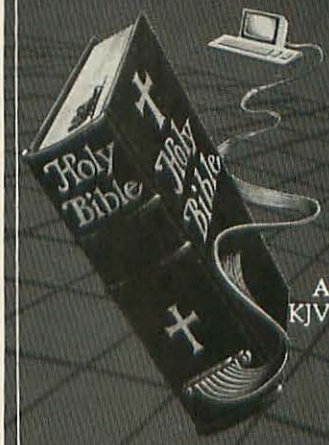
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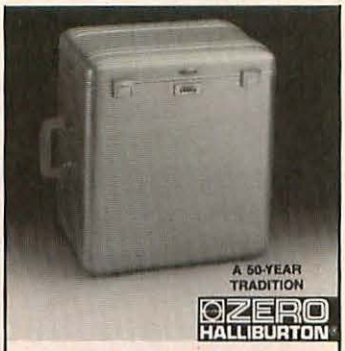
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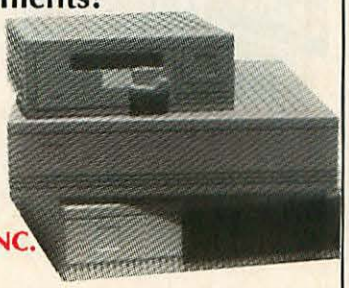
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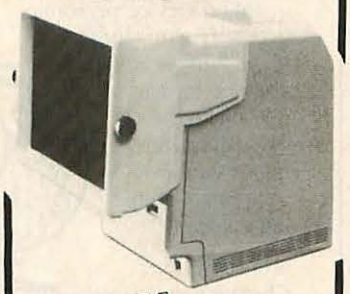


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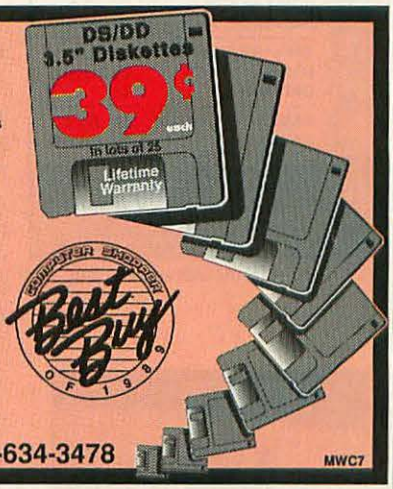
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BEST-SELLERS

BUSINESS SOFTWARE

Months on chart	Last month	This month		
63	1	1	**Microsoft Word**	Microsoft
54	5	2	**Microsoft Excel**	Microsoft
50	6	3	**Aldus PageMaker**	Aldus
42	4	4	**Microsoft Works**	Microsoft
15	—	5	**FileMaker II**	Claris
39	7	6	**MacWrite II**	Claris
4	3	7	**Quicken**	Intuit
23	2	8	**WordPerfect for the Macintosh**	WordPerfect
16	—	9	**QuarkXPress**	Quark
7	—	10	**Wingz**	Informix

EDUCATION SOFTWARE

30	1	1	**Reader Rabbit**	The Learning Company
17	3	2	**Where in the World Is Carmen Sandiego?**	Brøderbund
1	—	3	**Math Blaster Mystery**	Davidson & Associates
8	5	4	**Math Rabbit**	The Learning Company
4	4	5	**Where in the USA Is Carmen Sandiego?**	Brøderbund

ENTERTAINMENT SOFTWARE

8	1	1	**SimCity**	Maxis Software
6	2	2	**Tetris**	Spectrum HoloByte
43	3	3	**Microsoft Flight Simulator**	Microsoft
2	—	4	**Shufflepuck Cafe**	Brøderbund
1	—	5	**The Hunt for Red October**	Electronic Arts

NETWORK/DATA COMMUNICATIONS

42	1	1	**TOPS**	TOPS
37	—	2	**AppleShare**	Apple Computer
1	—	3	**Screenshare**	White Knight
3	5	4	**MicroPhone II**	Software Ventures
9	3	5	**MacLink/MacLink Plus**	DataViz

HARD DISKS*

Months on chart	Last month	This month		
1	—	1	**Quantum 40MB**	Quantum
1	—	2	**Quantum 80MB**	Quantum
6	2	3	**MacStack SD40**	CMS Enhancements
8	3	4	**Apple Hard Disk 40SC**	Apple Computer
34	1	5	**Apple Hard Disk 20SC**	Apple Computer

ADD-IN BOARDS/MEMORY

32	1	1	**Radius Accelerator**	Radius
1	—	2	**DirectColor 24**	Radius
3	2	3	**ColorBoard 264**	RasterOps
19	3	4	**Radius Interface Display**	Radius
3	4	5	**Spectrum/8 Series III**	SuperMac Technology

UTILITY SOFTWARE

4	1	1	**SAM**	Symantec
4	4	2	**Adobe Type Manager**	Adobe
4	5	3	**SUM II**	Symantec
2	—	4	**Virex**	HJC Software
4	2	5	**PC Tools for the Macintosh**	Central Point Software

PRODUCT WATCH

Recent or forthcoming products of particular interest.

Personal LaserPrinter II *GCC Technologies*
Upcoming PostScript version

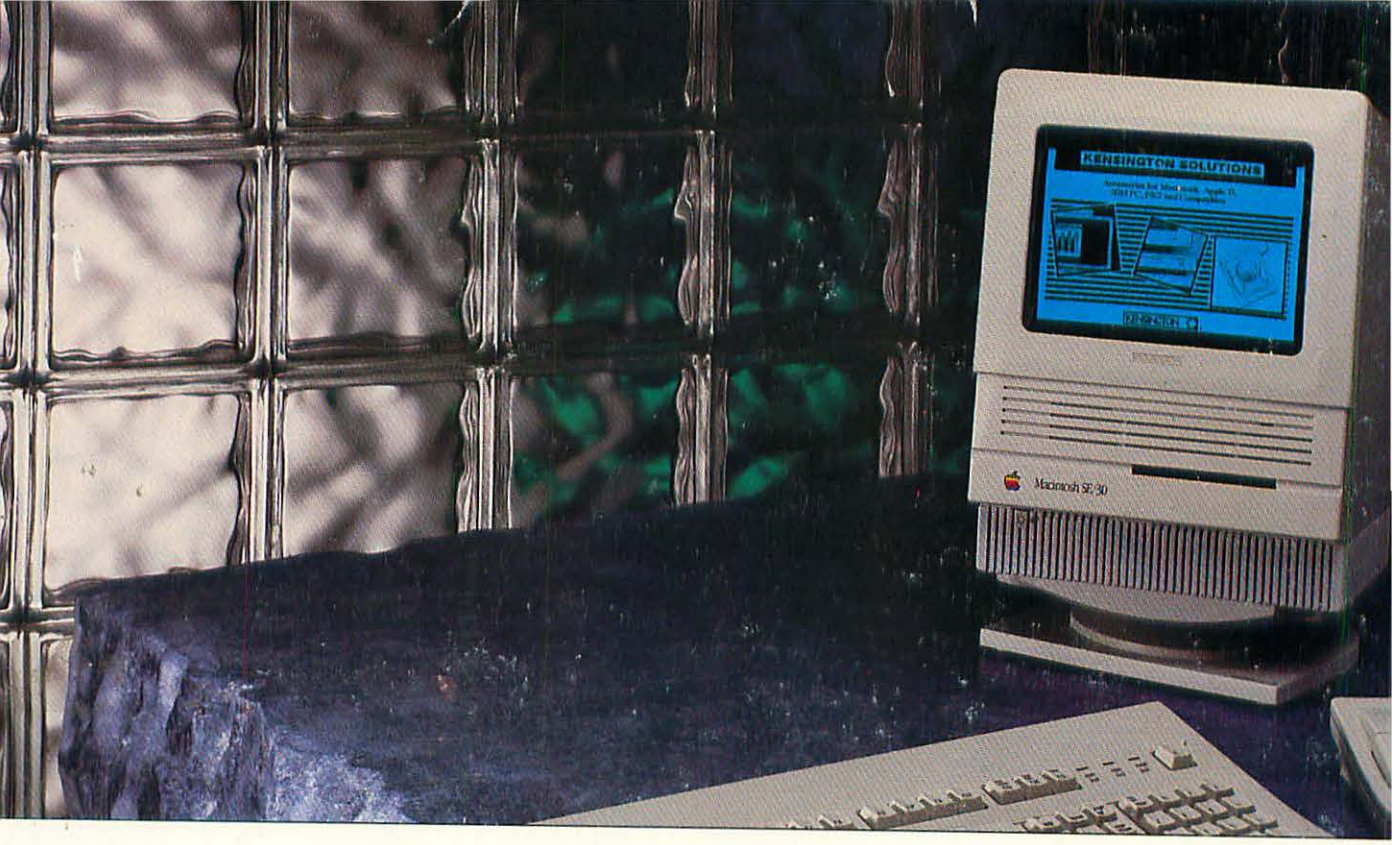
Shapes *Letraset*
Outlining and antialiasing module for Color Studio

Swivel 3D Professional *Paracomp*
3-D graphics package

Source: Exclusive InfoCorp survey of more than 125 Macintosh retailers and selected mail-order vendors. Covers sales during April 1990.

*Does not include hard disks installed at the factory.

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It looks so much a part of the SE, you would think it was designed by the same people who designed the SE.

The styling is complementary. The color identical. Even the same material is used.

And unlike generic filters, the fit is perfect. So light passes through the filter, never around it.

Kensington uses only optical quality glass with a ceramic anti-reflection and scratch-resistant coating.



The result is a 96% reduction in glare. And an improvement in contrast and clarity of up to 20 times.

In short, the most advanced eye-protection system you can find today—it even filters out VLF and ELF radiation and dissipates static.

Kensington has custom designed screens for the Mac, Mac Plus, Mac SE, Apple IIGS, as well as for the entire Mac II family of large screen monitors.



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